Part V

Additional Seismic Evaluation Procedures Modified from the SQUG GIP

11. RELAY FUNCTIONALITY REVIEW

11.1 INTRODUCTION

As part of the seismic evaluation of DOE facilities, it may be necessary to perform a relay seismic functionality review. The purpose of this review is to determine if the equipment listed on the Seismic Equipment List (SEL), as described in Chapter 4, could be adversely affected by relay malfunction in the event of a Design Basis Earthquake (DBE) and to evaluate the seismic adequacy of those relays for which malfunction is unacceptable. The term "relay malfunction" is used to designate relay chatter or inadvertent change-of-state of the electrical contacts in a relay, motor starter, or switch. The purpose of this section of the DOE Seismic Evaluation Procedure is to provide an overview of the relay evaluation procedure and describe the interfaces between other activities described in the DOE Seismic Evaluation Procedure and the relay evaluation.

Information on a detailed procedure for evaluating relays is contained in Section 6 of the SQUG GIP (Ref. 1) and in its supporting documents. The SCEs and relay evaluation personnel should not use the material in this chapter unless they have thoroughly reviewed and understood the information in Section 6 of the SQUG GIP and its supporting documents. The DOE Seismic Evaluation Procedure contains a condensed version of the detailed procedure in the SQUG GIP. In Sections 11.2 through 11.5, the relay functionality review is intended to identify most of the essential relays that should be evaluated, to provide the procedure for evaluating those relays, and to be a cost effective approach for identifying "bad actors". Section 11.2 discusses three methods for establishing the seismic capacity of relays and includes a list of low ruggedness relays. Section 11.3 provides two methods for determining the seismic demand on relays mounted in cabinets or other structures. The seismic capacity is compared to the seismic demand using the guidelines of Section 5.4. Section 11.4 provides information for conducting a walkdown as part of the relay evaluation. This walkdown can be incorporated as part of the Screening Evaluation and Walkdown described in Section 2.1.3. Finally, Section 11.5 discusses techniques for resolving relay outliers.

11.2 SEISMIC CAPACITY OF RELAYS

11.2.1 Generic Seismic Test Data¹

Seismic test data is available on a variety of types of relays. These data have been reduced to Generic Equipment Ruggedness Spectra (GERS) in Reference 44 which define seismic acceleration levels below which relays can be expected to function without chatter or other damage. The GERS are seismic response spectra within which a class or subclass of relays has functioned properly during shake-table tests. In some cases the GERS are based on "success" data (that is, seismic test spectra for which no relay malfunction occurred). In this case, the test spectra for one or more relays in a given class represent a lower bound of the seismic ruggedness of the class. In other cases, the GERS may be based on "fragility" data as the seismic response spectra in which failures or malfunctions occurred. In this case, the GERS represent an upper bound of the seismic ruggedness of the relay class. Where both success and fragility data are available for a given relay class, the GERS fall between the two spectra. Engineering judgment was used in developing the GERS level to smooth out sharp peaks and valleys in the test response spectra.

An example GERS for several auxiliary relay types is shown in Figure 11.2-1. A normalized GERS shape is illustrated at the top of this figure and GERS levels (i.e., the peak acceleration) for example relays are tabulated at the bottom of this figure. Complete sets of all available GERS for relays are given in Reference 44.

¹ Based on Section 6.4.1 of SQUG GIP (Ref. 1)

11.2.2 <u>Earthquake Experience Data</u>²

Data have been obtained on relay performance, specific failures, relay vulnerabilities, and other information from actual earthquake experience in industrial power plants and other facilities which have undergone significant earthquakes. This information has been used to identify unacceptable relay types such as those which are known to be susceptible to damage or chatter due to moderate shaking. Unacceptable relays and related contact devices that must be avoided are listed and considered in the screening procedure given in Reference 45. Based on earthquake experience data and on test data, solid state relays and mechanically-actuated switches are considered seismically rugged and need not be evaluated for relay chatter. Details and restrictions regarding the screening of both the low-ruggedness and high-ruggedness classes of control circuit devices are described in Reference 45.

Table 11.2-1 from Appendix E of Reference 45 provides a list of low ruggedness relays, or "bad actors". The relay evaluation procedure seismic demand determination and GERS cannot be applied to these relays because of their low seismic ruggedness or demonstrated sensitivity to high frequency vibration. Relays listed in Table 11.2-1 should be classified as outliers and case specific techniques or current qualification techniques must be utilized to demonstrate the adequacy of these relays.

11.2.3 Relay-Specific Test Data³

The GERS and earthquake experience data discussed above are expected to apply to many of installed relay types in essential circuits. Facility-specific and relay-specific seismic test data, where available, can also be used. This seismic test data is generally maintained by specific facilities and/or relay suppliers and has not been included in the relay GERS. It may be used on a relay-specific or facility-specific basis.

² Based on Section 6.4.1 of SQUG GIP (Ref. 1)

³ Based on Section 6.4.1 of SQUG GIP (Ref. 1)

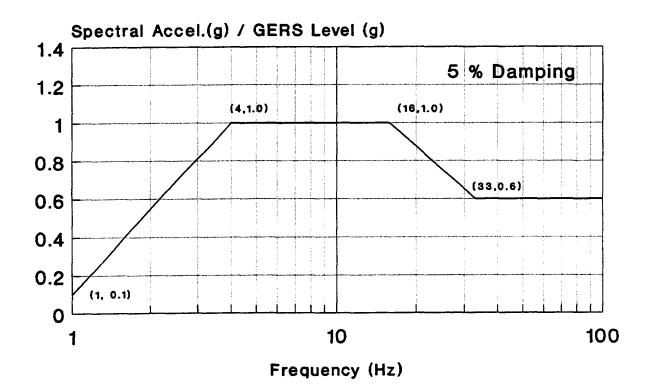
Table 11.2-1 Low Ruggedness Relays (Appendix E of Reference 45)

RELAY	OPERATING MODE	REFERÊNCES
GE CFD	All	1 (81-14/313, 82-26/348, 86-13/293, 2, 3,
		4, 5 (IN 85-82), 6
GE CFVB	All	2, 3, 6
GE CEH	All	2, 6
GE CPD	All	2, 6
GE IJD ⁺ (non 1E)	All	2
GE PVD 11 and PVD21	All	1 (84-20/352, 3, 4 (GE)
GE RAV11	All	4 (GE)
GE HGA	(DE, NC)	1 (84-18/331, 86-15/269, 87-11/250), 4, 5, (IN 88-14)
GE BFA65	All	4 (BNL)
<u>W</u> HLF	All	2, 6
WHU (non 1E)	All	3, 6
<u>W</u> ITH	All	1 (81-44/346 NS 81-37/346)
WARMLA	All	5 (IN 82-55)
<u>W</u> PMQ	All	1 (85-16/247)
<u>W</u> SG	(DE, NC)	4 (ANCO)
<u>w</u> sv	All	4 (BNL)
<u>W</u> SC	All	4 (BNL)
<u>W</u> SSC	All	4 (BNL)
<u>W</u> COM-5 (Non 1E)**	All	4 (<u>W)</u>
ASEA ARMX-L	AII	1 (88-06/387)
English Electric YCG ⁺	All	2
Mercury Switches	All	1 (86-25/249), 2
Sudden Pressure Switches **	All	2

References:

- **LERS** 1.
- Earthquake Experience Data
- SAFEGUARDS Data 3.
- IEEE 501 Test Data
- Notices, Bulletins, etc. Induction cup or induction cylinder design
- De-energized DE =Energized E =
 - NC =**Normally Closed Contact**
 - Normally Open NO =
 - All = All Modes
- Damage has occurred to this relay in an earthquake and it must be assumed that it will be inoperable following a DBE level earthquake.
- Transformer pressure surge sensing devices π
- ** With SSC-T IITH unit

Normalized Relay GERS Auxiliary, Industrial Type 2 (300V)



		GERS Le	vel ¹
Type and Submodel Identification	Non-0	perate NC ²	Operate NO/NC ²
Make #1, Model A	10	9	10
Make #2, Model A	10	9	10
Make #2, Model B	10	_3	10
Make #3, Model A	10	9	10
Make #4, Model A	10	5	10
Make #5, Model A	10	10	10

[&]quot;GERS Level" is the spectral acceleration (g) from 4 to 16 Hz for 5% damping.

Generic Equpment Ruggedness Spectra (GERS) for Auxiliary Relays Figure 11.2-1 (Reference 44) (Figure 6-2 of SQUG GIP, Reference 1)

[&]quot;NO" = Normally Open; "NC" = Normally Closed; "NO/NC" = Change State.
"-" = Data not available. 2

³

11.3 SEISMIC DEMAND ON RELAYS

This section has two methods for determining the seismic demand on relays. Seismic adequacy of essential relays can be confirmed by successful application of either one of these methods. Details on the methods for determining seismic demand on relays is contained in Section 6 of the SQUG GIP (Ref. 1) and in its supporting documents. After computing the seismic demand on the relays, the demand is then compared to the seismic capacity (discussed in Section 11.2) using the guidelines of Section 5.4.

11.3.1 <u>Use of In-Cabinet Amplification Factors</u>⁴

The first method for determining relay seismic demand is based on: (1) using a Seismic Demand Spectrum (SDS) at the base of the cabinet containing the relay and (2) multiplying this spectrum by an in-cabinet Amplification Factor (AF). To use this method, the essential relay should not be one of the low-ruggedness types listed in Table 11.2-1. The seismic demand on relays can be represented by an In-cabinet Demand Spectrum (IDS) which is computed using the following equation:

 $IDS = SDS \times AF$

Where:

SDS - Seismic Demand Spectrum (SDS) as described in Section 5.2.3. The SDS is a scaled in-structure response spectrum computed from the DBE.

AF - in-cabinet Amplification Factor, as given in Table 11.3-1, for various types of cabinets. The guidelines and criteria for identifying the various cabinet types are included in Appendix I of Reference 45.

A relay is considered seismically adequate if the IDS is bounded by the relay capacity spectrum in the frequency ranges from 4 - 16 Hz and from 33 Hz and above, i.e., the zero period acceleration (ZPA). If the guidelines for this method cannot be applied, or the seismic demand is not bounded by the seismic capacity of the relay, then the following method can be used instead.

⁴ Based on Section 6.4.2 of SQUG GIP (Ref. 1)

Table 11.3-1 In-Cabinet Amplification Factors for Use with Section 11.3.1 (Table 6-2 of SQUG GIP, Ref. 1)

Type of Cabinet	In-Cabinet Amplification Factor (AF) ¹
MCC-type cabinet (defined in Appendix I of Reference 45)	3
Conventional control panel or benchboard (defined in Appendix I of Reference 45)	4.5 ²
Switchgear-type cabinet or similar large unsupported panel (defined in Appendix I of Reference 45)	7
Other type of cabinet, panel, or enclosure for which cabinet-specific amplification data exists	3

- The SCEs and relay evaluation personnel should not apply these amplification factors unless they have thoroughly reviewed and understood the information in Section 6 of the SQUG GIP (Ref. 1) and its supporting documents such as References 43 and 45.
- To use an amplification factor of 4.5, the control panel or benchboard must meet the restrictions (or caveats) given in Reference 45, Appendix I, except that a 13 Hz lower bound fundamental frequency shall apply instead of the 11 Hz fundamental frequency specified by the relevant caveat in Reference 45, Appendix I, when assessing:

devices located on internal independent racks, cantilevered appendages, such as cantilevered wing walls attached to a front face or side wall, and

access doors which are part of a control panel or benchboard. Note that one intent of the control panel and benchboard caveats is to restrict use of this amplification factor to only those cabinets and panels which have all significant natural modes at 13 Hz and higher. The amplification factor is a function of the panel frequency with the most flexible panel mode typically being the diaphragm, or out-of-plane, mode.

For the "Other" type of cabinets, an effective broad-based amplification factor can be developed from appropriate test data. Reference 43 can be used for this purpose as a guide in which an effective in-cabinet amplification factor can be obtained by multiplying the measured peak amplification factor, for the location in the cabinet where the relay is mounted, times an appropriate reduction factor. Appropriate reduction factors are discussed in Reference 43; for typical, narrow peak amplification spectra, the reduction factor is 0.6.

11.3.2 <u>Use of In-Cabinet Response Spectra</u>⁵

In this method, the technique of computing relay seismic demand is the same as in Section 11.3.1 (i.e., the demand spectrum is bounded by the capacity spectrum in the frequency ranges from 4-16 Hz and from 33 Hz and above) except that instead of using an in-cabinet amplification factor to determine the seismic demand on the relay, an in-cabinet response spectrum is used. To use this method, the essential relay should not be one of the low-ruggedness types listed in Table 11.2-1. For comparison to relay capacity spectrum, the in-cabinet response spectrum can be treated similar to the IDS of Section 11.3.1. There are two methods for developing in-cabinet response spectra, depending upon the type of equipment:

Control Room Benchboards and Panels. An amplified, in-cabinet response spectrum can be determined using the methodology and software described in Reference 43 for control room benchboards and panels. In this option, the cabinet or panel evaluated must meet the restrictions (or caveats) given in Reference 43. A 13 Hz lower bound frequency shall apply instead of the 11 Hz fundamental frequency specified by the relevant caveat in Reference 43 when assessing devices located on internal independent racks, cantilevered appendages such as cantilevered wing walls attached to a front face or side wall, and access doors which are part of a control panel or benchboard. Note that one intent of the control panel and benchboard caveats is to restrict use of this amplification factor to only those cabinets and panels that have all significant natural modes at 13 Hz or higher. The use of Reference 43 software should not be extended to other classes of equipment without the review and approval of the DOE.

Other Types of Equipment. For other types of cabinets and panels that are not covered by Reference 43, in-cabinet response spectrum can be determined using analytical and/or test methods which are suitable for the specific case. These other methods should be justified in the documentation of the Relay Functionality Review. This is equivalent to the case-specific analysis and/or test approach. Caution should be exercised when using this method to determine in-cabinet response spectra by considering the effects of local flexibility and mounting details such as local plastic deformation, slotted holes, fitted connections, etc.

11.4 RELAY WALKDOWN⁶

Information on a detailed procedure for conducting relay walkdowns is contained in Section 6 of the SQUG GIP (Ref. 1) and in its supporting documents. The SCEs and relay evaluation personnel should refer to the details in these documents when conducting relay walkdowns. A walkdown should be performed as a part of the relay evaluation. The purposes of the relay walkdown are to:

- Obtain information needed to determine cabinet types which house essential relays and to determine the in-cabinet amplification, where needed, for the seismic capacity methods described above.
- Evaluate the seismic adequacy of the cabinets or enclosures which support the essential relays.
- Spot check mountings of essential relays.
- Spot check the essential relays to evaluate their types and locations, including checks for vulnerable relays (as listed in Table 11.2-1).

⁵ Based on Section 6.4.2 of SQUG GIP (Ref. 1)

⁶ Based on Section 6.5 of SQUG GIP (Ref. 1)

These purposes can be accomplished during one walkdown or separately during different walkdowns. To accomplish the first purpose of the relay walkdown, the cabinets or panels which house essential relays should be identified and the information needed to determine in-cabinet amplification should be reviewed. A SCE and a Relay Reviewer (as discussed in Section 3.3.3) should accomplish this purpose. The serial and model number of the relays should be compared with the applicable relay numbers in References 43 and 45.

The second purpose, evaluation of the seismic adequacy of the cabinet or enclosure supporting the relay, should be done as a part of the Screening Evaluation and Walkdown as described in Section 2.1.3. Note that the cabinets or enclosures supporting essential relays should be identified prior to this walkdown.

The third purpose of the relay walkdown is to spot check relay mountings to confirm that relays are mounted in accordance with manufacturer's recommendations. The objective of the spot checks is to identify any abnormal or a typical relay mounting techniques. The specific number of relays to be checked is not quantified because the bulk of the relays addressed in the relay evaluation procedure are typically located in a few specific facility areas and can be easily checked. Most of the relays encountered in the relay evaluation can be checked by opening relay cabinets in the following areas:

- Control room
- Relay room or auxiliary control room
- Switchgear rooms
- Diesel generator control panel area

Spot checking relay mountings can be performed during a separate relay walkdown by personnel familiar with relay installation. Alternatively, relay mountings may be spot checked during the seismic walkdown when in-cabinet amplification information is gathered. Special preparation or training is not required for spot checking relay mountings. Indications such as proper relay label orientation, mounting bolts in place and tight, and whether the relay is snug in its mounting bracket are sufficient to judge the adequacy of the mounting; analytical checks are not intended except as a means to evaluate atypical mountings.

The fourth purpose of the relay walkdown is to confirm relay types and locations. This can be performed at the same time that the relay mountings are checked and by the same individuals. The approach for confirming relay types by the relay walkdown team includes noting relay types observed in the cabinets and then comparing this with the relays identified on electrical drawings. It is important to note that relay mountings are considered to be standard and the circuit drawings are assumed to be correct and up-to-date. Spot checks of the relay mountings and relay types are a mechanism to confirm these assumptions. Any significant spot check discrepancies will necessitate more thorough relay inspections.

11.5 OUTLIERS⁷

An outlier is defined as an essential relay which does not meet the guidelines for:

- Relay seismic capacity and seismic demand as given in Sections 11.2 and 11.3
- Relay mounting as given in Section 11.4

Chapter 12, Outlier Identification and Resolution, is used when an outlier is identified and the cause(s) for not meeting the guidelines should be documented with the Outlier Seismic Evaluation Sheet (OSES) provided in Chapter 13. Methods are given in this section for use as a generic basis to evaluate the seismic adequacy of essential relays. Therefore, if an essential relay fails these generic methods, it may not necessarily be deficient for seismic loading; however, additional evaluations are needed to show that it is adequate. Some of the additional evaluations and alternative methods for demonstrating seismic adequacy are summarized below.

- Refine the seismic requirements and/or analyses.
- Test the relay and/or the cabinet in question.
- Re-design and modify the circuit to make the relay function nonessential.
- Relocate the relay to reduce the seismic demand imposed upon it.
- Replace the relay with a seismically qualified one.
- Stiffen the relay mounting.
- Use other justifiable approaches.

Generic methods for resolving outliers are also discussed in Chapter 12.

⁷ Based on Section 6.6 of SQUG GIP (Ref. 1)

12. OUTLIER IDENTIFICATION AND RESOLUTION

12.1 INTRODUCTION¹

The purpose of this chapter is to define the term outliers, how they should be identified and documented, and how they may be resolved. An outlier is an item of equipment that does not comply with all of the screening guidelines provided in the DOE Seismic Evaluation Procedure. The screening guidelines are intended to be used as a generic basis for evaluating the seismic adequacy of equipment at DOE facilities. If an item of equipment fails to pass these generic screens, it may still be shown to be adequate for seismic loading by additional evaluations.

This chapter describes how outliers should be identified and documented for equipment that does not pass the screening guidelines for:

- Electrical Equipment (Sections 8.1)
- Mechanical Equipment (Sections 8.2 and 10.2)
- Tanks (Sections 9.1 and 10.3)
- Piping, Raceway, and Duct Systems (Sections 9.2, 10.1, and 10.4)
- Architectural Features and Components (Section 10.5)
- Relays (Chapter 11)

Several generic methods for resolving outliers are summarized in this chapter. Specific methods for addressing the different types of equipment are also discussed in the sections where the screening guidelines are described.

The chapter is organized as follows:

- A summary of generic methods for resolving outliers is contained in Section 12.2.
- Suggested methods for grouping and pooling of outliers from several different facilities for efficient reconciliation are provided in Section 12.3.
- The reasons for classifying an item of equipment as an outlier are described in Section 13.3 along with a description of how outliers should be documented.

12.2 OUTLIER RESOLUTION²

Several generic methods for resolving outliers are summarized below. Additional specific methods for addressing outliers for the different types of equipment are also discussed in the sections where the screening guidelines are described. The details for resolving outliers, however, are beyond the scope of this procedure. It is the responsibility of the facility to resolve outliers using their existing engineering procedures as they would resolve any other seismic concern.

It is permissible to resolve outliers by performing additional evaluations and applying engineering judgment to address those areas which do not meet the screening guidelines contained in this

¹ Based on Section 5.0 of SQUG GIP (Ref. 1)

² Based on Section 5.3 of SQUG GIP (Ref. 1)

procedure. Strict adherence to the screening guidelines in the DOE Seismic Evaluation Procedure is not absolutely required; however, these additional outlier evaluations and the application of engineering judgment should be based on a thorough understanding of the screening guidelines contained in the DOE Seismic Evaluation Procedure and the background and philosophy used to develop these guidelines as given in the applicable references. The justification and reasoning for considering an outlier to be acceptable should be based on mechanistic principles and sound engineering judgment.

The screening guidelines have been thoroughly reviewed by experts to ensure that they are acceptable for generic use in DOE facilities; however, the resolution of outliers for individual facilities will not likely receive the same level of review as the generic screening guidelines. Therefore, it is recommended that the evaluations and judgments used to resolve outliers be thoroughly documented so that independent reviews can be performed if necessary as discussed in Section 2.2.

Some of the methods summarized below for resolving outliers build upon the earthquake experience and generic testing data discussed in the DOE Seismic Evaluation Procedure. Facility personnel may use the Screening Evaluation and Walkdown procedure described in Section 2.1.3 in applying earthquake experience or generic testing data which was not available during the initial walkdown for resolution of outliers or they may develop an alternative approach which best fits the circumstances of the specific outlier issue. Outlier issues may also be resolved using current procedures and criteria. As an alternative, facility personnel may choose to not perform corrective modifications or replacement of outliers. Instead, facility personnel must then explain to the DOE the safety implications of not modifying or replacing the outliers.

Methods which can be used to resolve outliers include the following:

- 1. The subject equipment and/or its anchorage may be fixed or modified to bring it within the scope of the DOE Seismic Evaluation Procedure or in compliance with some other seismic qualification method. For example, appropriate anchorage should be installed for equipment lacking adequate anchorage.
- 2. The subject equipment and/or its anchorage may be evaluated more rigorously to determine appropriate techniques for strengthening it in order to bring it within the scope of the DOE Seismic Evaluation Procedure or in compliance with some other seismic qualification method. For example, the equipment or its supports may be stiffened so that its resonant frequency is increased to a frequency where the seismic demand is less. Providing an upper lateral support to a floor-mounted item of equipment would typically increase the fundamental frequency to above 8 Hz.
- 3. The subject equipment may be replaced with equipment which is covered by screening guidelines in the DOE Seismic Evaluation Procedure or has been seismically qualified by some other means.
- 4. Detailed engineering analyses may be performed to more carefully and/or accurately evaluate the seismic capacity of the equipment and/or the seismic demand to which it is exposed. For example, when using more accurate analytical procedures, consideration should be given to using "as-built" rather than specified minimum material properties for the equipment.
- 5. The earthquake experience equipment class may be expanded to include the equipment or specific equipment features of interest. The scope of the earthquake experience data which is documented in References 19 and 35 represents only a portion of the total data available.

An expansion of the earthquake experience equipment classes beyond the scope included in Chapters 8, 9, 10, and 11 could include a more detailed breakdown by type, model or manufacturer of a particular class of equipment, less restrictive requirements for inclusion within a class, or development of a sub-category with higher capacity.

Extension of the generic experience equipment classes beyond the descriptions in the DOE Seismic Evaluation Procedure is subject to DOE review and to an extensive peer review beyond what is discussed in Section 2.2. The external peer review for expanding the earthquake experience database should be of similar caliber as that required during the original development of the database. An extension of the earthquake experience database must satisfy the requirements discussed in Section 1.4.4.

- 6. In-situ tests may be performed on the equipment of interest to determine more accurately the equipment dynamic properties.
- 7. Shake table tests may be performed on the same or similar equipment to check its seismic capacity or evaluate more carefully its dynamic properties.
- 8. Information not available during the Screening Evaluation and Walkdown may be obtained and used to meet the DOE Seismic Evaluation Procedure screening guidelines.

The most appropriate type of outlier evaluation will depend upon a number of factors, including the reason that the equipment failed the screening guidelines, whether the outlier lends itself to additional review of the earthquake experience or generic testing data or an additional analytical evaluation, the cost of design or hardware modifications, and how extensive the problem is in the facility and in other facilities. Any type of outlier evaluation will require peer review as discussed in Section 2.2. The DOE should be provided with a proposed schedule for complete resolution or future modifications and replacement of outliers. Documentation of the methods used by the facility for resolution of outlier issues and tracking of their implementation can be provided in the OSES as discussed in Section 13.3.

12.3 GROUPING AND POOLING OF OUTLIERS³

Once an outlier has been identified and an OSES is prepared for that item of equipment, the OSES could then be placed in an appropriate outlier category or "basket". There could be one basket for each class of equipment for which there are outliers. Within each basket the outliers could be further divided into the various reasons that the equipment failed the screening evaluation (e.g., capacity vs. demand, caveats, anchorage, or interactions). The organization of the outliers in this manner can facilitate reconciliation of recurring outlier issues.

One method to efficiently reconcile recurring outliers in DOE facilities is for them to pool the outlier information obtained during walkdowns. One means of pooling this information is to tabulate the outliers, including the information contained on the SEDS and, if available, the method ultimately used to evaluate the seismic adequacy of the outlier. These tables may be generated and organized, using a data base management program. This summary may be distributed to DOE facilities so that common outliers may be evaluated using the experience obtained from other facilities. For example, one facility may have one or several unreconciled outliers that an SRT at another facility was able to evaluate. The facility with the unreconciled outliers may be able to employ a similar methodology if the detailed information used in the outlier resolution is shared. Outliers from several DOE facilities may also be resolved more cost-effectively using shared funding.

³ Based on Section 5.4 of SQUG GIP (Ref. 1)

13. DOCUMENTATION

13.1 INTRODUCTION¹

This section describes the various types of documents that should be generated with the Screening Walkdown and Evaluation Procedure and how they relate to each other. This section also describes the types of information which could be submitted to the DOE. The following five major types of documents are used with the DOE Seismic Evaluation Procedure:

- Seismic Equipment List (SEL)
- Screening Evaluation Work Sheets (SEWS)
- Outlier Seismic Evaluation Sheets (OSES)
- Screening Evaluation and Data Sheets (SEDS)
- Equipment Seismic Evaluation Report (ESER)

The Seismic Equipment List (SEL) and supporting documents should describe the overall approach used in identifying the equipment listed in the SEL and the basis for selecting the listed equipment. In addition, the SEL and its supporting documentation should describe the method used for verifying the compatibility of the SEL with the facility operating procedures. Further guidance for developing the SEL is provided in Chapter 4, which discusses the contents of and methods for generating the SEL.

The Screening Evaluation Work Sheets (SEWS), Outlier Seismic Evaluation Sheets (OSES), Screening Evaluation and Data Sheets (SEDS), and Equipment Seismic Evaluation Report (ESER) are discussed in Sections 13.2, 13.3, 13.4, and 13.5, respectively. Copies of the SEWS, OSES, and SEDS forms follow Section 13.5. The forms contained in the DOE Seismic Evaluation Procedure are suggested formats for documenting the information from the seismic evaluations. Other forms, which contain equivalent information to those discussed in this chapter, may be used to document the results of the seismic evaluations using this Procedure.

The extent of suggested documentation for the seismic evaluations is limited. The underlying reason is that the evaluations are to be done by highly-qualified individuals who have been trained in the use and application of the DOE Seismic Evaluation Procedure. For example, SCEs should have the background, experience, and training to make engineering judgments during the facility walkdown and thus avoid having to develop large quantities of backup documentation to record every decision made in applying the procedure. These SCEs are then held accountable for the scope, accuracy, and completeness of the Screening Evaluation and Walkdown process by signing that the results of the seismic evaluations are correct and accurate. One of these signatories should also be a licensed Professional Engineer, as discussed in Section 3.2.

13.2 SCREENING, EVALUATION WORK SHEETS²

The purpose of the Screening Evaluation Work Sheets (SEWS) is to provide a convenient summary and checklist of the seismic evaluation criteria described in the DOE Seismic Evaluation Procedure. During the seismic walkdown, the SEWS can serve as a tool for collecting and organizing the important information from the seismic evaluation. The SEWS, or a similar checklist, should be used during the facility walkdown to document the results of the evaluation.

¹ Based on Section 9.0 of SQUG GIP (Ref. 1)

² Based on Appendix G of SQUG GIP (Ref. 1)

Equipment class caveats and guidelines are summarized on the SEWS. Other informal documentation may be used by the SCEs as aids during the Screening Evaluation and Walkdown. These may include calculations, sketches, photographs, and charts. The SEWS should not be used unless the user has a thorough understanding of the DOE Seismic Evaluation Procedure and the reference documents.

There are 26 SEWS for most of the classes of equipment discussed in the DOE Seismic Evaluation Procedure. The 26 SEWS correspond to the following classes of equipment and sections from Chapters 8 through 10:

Batteries on Racks (Section 8.1.1) Motor Control Centers (Section 8.1.2) Low-Voltage Switchgear (Section 8.1.3) Medium-Voltage Switchgear (Section 8.1.4) Distribution Panels (Section 8.1.5) Transformers (Section 8.1.6) Battery Chargers and Inverters (Section 8.1.7) Instrumentation and Control Panels (Section 8.1.8) Instruments on Racks (Section 8.1.9) Temperature Sensors (Section 8.1.10) Fluid-Operated/Air-Operated Valves (Section 8.2.1) Motor-Operated Valves (Section 8.2.2 MOV) Solenoid-Operated Valves (Section 8.2.2 SOV) Horizontal Pumps (Section 8.2.3) Vertical Pumps (Section 8.2.4) Chillers (Section 8.2.5) Air Compressors (Section 8.2.6) Motor-Generators (Section 8.2.7) Engine-Generators (Section 8.2.8) Air Handlers (Section 8.2.9) Fans (Section 8.2.10) Horizontal Tanks and Heat Exchangers (Section 9.1.2) Cable and Conduit Raceway Systems (Section 9.2.1) Piping (Section 10.1.1) HVAC Ducts (Section 10.4.1)

SEWS are not provided for several classes of equipment. For these classes of equipment, the SEWS for Section 10.X.X can be used as a template and the checklists provided in the sections for those classes of equipment can be used during the facility walkdown. SEWS are not provided for the following classes of equipment and sections:

Vertical Tanks (Section 9.1.1)
Underground Piping (Section 10.1.2)
HEPA Filters (Section 10.2.1)
Glove Boxes (Section 10.2.2)
Miscellaneous Machinery (Section 10.2.3)
Underground Tanks (Section 10.3.1)
Canisters and Gas Cylinders (Section 10.3.2)
Unreinforced Masonry (URM) Walls (Section 10.5.1)
Raised Floors (Section 10.5.2)
Storage Racks (Section 10.5.3)
Relays (Chapter 11)

Most of the information at the top of each SEWS (equipment ID number, equipment description, equipment location, etc.) can be entered on the SEWS prior to the facility walkdown. If a data base program is used to develop the SEL, then the information at the top of each page of the SEWS can be printed directly from the data base file containing the SEL information.

The SEWS can be used as a checklist by circling the appropriate symbol in response to each statement. The meaning of the symbols is given below:

- Y Yes. This criterion is met. ("Y" is always the favorable response, i.e., all the "Y" symbols should be circled if an item of equipment is seismically adequate.)
- N No. This criterion is not met.
- U Unknown. It cannot be determined whether this criterion is met at this time. (This response can be used while the screening evaluation is in progress to identify criteria which must be evaluated later.)
- N/A Not Applicable. Some of the criteria may not apply for a particular item of equipment.

Some of the statements on the SEWS ask which of several alternatives is being used in the Screening Evaluation and Walkdown and the meaning of these symbols is self-explanatory. Likewise, when all the questions have a final response, the last question in each section of the SEWS can then be answered.

The SEWS also provide space to record information about the item of equipment, to document any comments the SCEs may wish to make, to document the reason why the intent of any caveats and guidelines are met without meeting the specific wording of the caveat rule, to sketch the equipment, and to sign off. In addition, the SEWS has a "Recommend Resolution" section to summarize the equipment evaluation. For equipment identified as an outlier, this section provides space to identify potential outlier resolution approaches. The resolution choices are:

- Maintenance action
- Further evaluation
- Retrofit design
- Other
- No further action required. Equipment is seismically adequate.

At the bottom of the SEWS are signature lines for all those performing the Seismic Evaluation and Walkdown. As discussed in Chapter 3, there should be at least two SCE signatories and one of the SCEs should be a licensed Professional Engineer. A signature on the SEWS indicates the SCE is in agreement with all the entries and conclusions entered on the sheet and all signatories should agree with all the entries and conclusions.

The SEWS are designed to be compatible with the Screening Evaluation Data Sheets (SEDS) discussed in Section 13.4 so that the summary information from the SEWS can be transferred directly to the SEDS. The responses to the final question in each section of the SEWS and the overall conclusion can be entered directly into the appropriate column in the SEDS discussed in Section 13.4.

13.3 OUTLIER SEISMIC EVALUATION SHEETS³

The Outlier Seismic Evaluation Sheets (OSES) are used to document the reason(s) for an item of equipment identified as an outlier during a screening evaluation to fail the screening guidelines. A separate OSES should be completed for each item of equipment classified as an outlier as discussed in Chapter 12.

An item of equipment listed in the SEL, as described in Chapter 4, should be identified as an outlier if it does not meet the screening guidelines covered in the other sections of this procedure. If an item of equipment is identified as an outlier during a screening evaluation in one of the sections of the DOE Seismic Evaluation Procedure, then the reason(s) for failing to satisfy the screening guidelines can be documented on an Outlier Seismic Evaluation Sheet (OSES). Other documentation, such as the Screening Evaluation Work Sheets (SEWS) discussed in Section 13.3, also have provisions for outliers. A separate OSES should be completed for each item of equipment classified as an outlier. The information to be included in each of the four sections of the OSES is described below.

Section 1 of the OSES describes the item of equipment identified as an outlier. This is the same information as found in the first seven columns of the SEDS which is discussed in Section 13.4. On the OSES, however, more space is provided to describe the equipment so that more details can be included to facilitate later resolution of this outlier issue without requiring repeated trips into the facility.

Section 2 of the OSES defines those conditions which cause that item of equipment to be classified as an outlier. This section should identify which of the conditions is the cause for the item of equipment becoming an outlier. More than one condition may be the cause for the outlier. In addition, the reason(s) for the equipment being an outlier should be described in more detail. For example, the SCEs could indicate at what frequencies the demand exceeded the capacity.

Section 3 of the OSES can be used to provide a proposed method for resolving the outlier issue, based on the experience and detailed evaluation of that item of equipment by the SCEs or the Lead Relay Reviewer. This is an optional part of the outlier identification process. This section also provides space for supplying any additional information which may be used to implement the proposed method of resolution. This may include information such as an estimate of the fundamental natural frequency of the equipment.

13.4 SCREENING EVALUATION AND DATA SHEETS4

The results of the Screening Evaluation and Walkdown, as described in Section 2.1.3, should be documented on walkdown checklists. These checklists include the Screening Evaluation Work Sheets (SEWS) discussed in Section 13.2 and the Screening Evaluation Data Sheets (SEDS). Preparation of the SEDS includes a review of generic and facility-specific seismic documentation and a facility walkdown of the equipment listed on the SEL. The completed SEDS constitute a tabulated summary for the formal documentation of the Screening Evaluation and Walkdown and reflect the final judgment of the SCEs. The SEDS offer a convenient way for tabulating the significant information from the SEWS for all the equipment listed on the SEL.

The SEDS is arranged in rows and columns and each row contains one item of equipment listed in the SEL. The columns contain information about the equipment and the results of the Screening Evaluation and Walkdown. Guidelines for completing each of the columns are provided below.

³ Based on Section 5.2 of SQUG GIP (Ref. 1)

⁴ Based on Section 4.6 of SQUG GIP (Ref. 1)

At the bottom of the SEDS are two sets of suggested signature blocks to be signed by those performing the Seismic Evaluation and Walkdown. The first block should be signed by all the SCEs who performed the Screening Evaluation and Walkdown. There should be at least two signatories and one of which should be a licensed Professional Engineer. A signature indicates the SCE is in agreement with all the entries and conclusions entered on the SEDS. All signatories should agree with all the entries and conclusions.

The second block for signatures at the bottom of the SEDS is for use by a safety professional, systems engineer, or operations engineer who may provide critical information to the SCEs during their seismic evaluation of the equipment. Examples of such information include how a piece of equipment operates or whether a feature on the equipment is needed to accomplish its safety function. Information of this type is particularly important if an item of equipment is found during the walkdown which should be added to the SEL. It is left to the SCEs to determine whether this second block of signatures is needed. Only the signature of the safety professional, systems engineer, or operations engineer should be documented on the SEDS and details of the information supplied to the SCEs need not be included.

Note that the completed SEDS reflect the final judgment of the SCEs. Prior to arriving at this final judgment, there may have been several walkdowns, calculations, and other seismic evaluations which form the basis for determining whether the equipment meets the screening guidelines contained in the DOE Seismic Evaluation Procedure.

Compilation of the information on the SEDS can be done using a data base management system. This makes it possible to manipulate the order in which the equipment is listed on the sheets. It may be convenient to use SEDS by location in the facility. This may optimize the routing of the SCEs during the walkdowns so that backtracking is minimized and separate teams of SCEs can cover different parts of the facility. After the walkdown is complete, the data base management system can be used to sort the equipment on the SEDS into lists of outliers or other categories of equipment.

The contents of each of the 16 columns of the SEDS are described below.

Columns 1 through 6 contain information for identifying and locating the equipment on the SEL.

Column 1 contains the equipment class number.

<u>Column 2</u> contains the facility identification or tag number for the equipment. This is normally an alpha-numeric designation by which an item of equipment is uniquely identified in the facility. This identifier will permit direct access and a cross-reference to the existing facility files or data system for the item of equipment.

<u>Column 3</u> contains both a designation of the facility system to which the equipment belongs and a description of the equipment. If the system designation is placed at the beginning of this field, then the equipment list can be sorted by system with a data base management system.

<u>Column 4</u> identifies the building in which the equipment is located.

<u>Column 5</u> contains the floor elevation from which the item of equipment can be viewed by the SCEs.

<u>Column 6</u> contains a designation of the location of the equipment within the building. An example of this is by building column line intersection, such as F-12. This indicates the intersection of column lines F and 12. Alternatively, the room designation can be given; e.g., diesel generator room (DG room).

Columns 7 through 10 are used to document the source of the seismic capacity and the source of the seismic demand.

Column 7 contains the elevation at which the equipment is mounted; i.e., the elevation at which the equipment receives its seismic input (demand). This elevation should be determined by the SCEs during the walkdown. Note that this elevation may not be the same as the floor elevation given in Column 5.

Column 8 identifies the source of the seismic capacity. The following codes may be used:

DOC Component-Specific Seismic Qualification Documentation.

RS Reference Spectrum (for comparison to in-structure response spectra).

GERS Generic Equipment Ruggedness Spectra, GERS.

If the GERS are used, a number designation (XXX) should also be given to indicate which unique GERS is used. If seismic qualification documentation is used, reference to the documentation should be noted in Column 16.

Column 9 indicates the experience data factor, FED, for the equipment.

<u>Column 10</u> indicates the method used to define the seismic demand. The following codes may be used:

SDS Seismic Demand Spectrum

IDS In-Cabinet Demand Spectrum

If an in-structure response spectrum is used, a number designation should also be given to indicate which unique spectrum is used.

Columns 11 through 14 are used to document the results of the evaluation of the equipment against the four seismic screening guidelines: comparison of seismic capacity to seismic demand, caveat and guidelines compliance, anchorage adequacy, and seismic interaction.

<u>Column 11</u> indicates whether capacity of the equipment exceeds the demand imposed on it. The following codes may be used:

Y Yes, capacity exceeds demand.

N No, capacity does not exceed demand.

U Unknown whether capacity exceeds demand.

<u>Column 12</u> indicates whether the equipment is within the scope of the earthquake/testing equipment class and meets the intent of all the caveats and guidelines for the equipment class. The following codes may be used:

- Yes, the equipment is in the equipment class, and the intent of all applicable caveats and guidelines is satisfied.
- No, the equipment is not in the equipment class, or the intent of all applicable caveats and guidelines is not satisfied.
- U Unknown whether the equipment is in the equipment class or whether the intent of all applicable caveats is satisfied.
- N/A The earthquake/test equipment class and the caveats and guidelines are not applicable to this item of equipment.

<u>Column 13</u> indicates whether the equipment anchorage meets the anchorage screening guidelines. The following codes may be used:

- Y Yes, anchorage capacities equal or exceed seismic demand, and anchorage is free of gross installation defects and has adequate stiffness.
- N No, anchorage capacities do not equal or exceed the seismic demand, or anchorage is not free of gross installation defects, or anchorage does not have adequate stiffness.
- Unknown whether anchorage capacities equal or exceed seismic demand, or whether anchorage is free of gross installation defects or has adequate stiffness.
- N/A Anchorage guidelines are not applicable to this equipment; e.g., valves are not evaluated for anchorage.

<u>Column 14</u> indicates whether the equipment is free of adverse seismic interaction effects. The following codes may be used:

- Y Yes, the equipment is free of interaction effects, or the interaction effects are acceptable and do not compromise the function of the equipment.
- N No, the equipment is not free of adverse interaction effects.
- U Unknown whether interaction effects will compromise the function of the equipment.

Columns 15 and 16 are used to document the overall result of the equipment evaluation and to record a note number for explaining anything unusual for an item of equipment.

<u>Column 15</u> indicates whether, in the final judgment of the SCEs, the seismic adequacy of the equipment is verified. Note that this judgment may be based on one or more walkdowns, calculations, and other supporting data. The following codes are used:

- Y Yes, seismic adequacy has been verified, i.e., code "Y", for all the applicable screening guidelines:
- (1) seismic capacity is greater than demand,
- (2) the equipment is in the earthquake/test equipment class and the intent of all the caveats and guidelines is met,
- (3) equipment anchorage is adequate, and
- (4) seismic interaction effects will not compromise the function of the item of equipment.
- No, seismic adequacy does not meet one or more of the seismic evaluation criteria. Equipment is identified as an outlier requiring further effort in accordance with Chapter 12.

Note that there is no "Unknown" category in Column 15 since this column represents the <u>final</u> judgment by the SCEs. At this point, the item of equipment should be either verified to be seismically adequate (Y) or found to be lacking in one or more areas (N) and should be evaluated as an outlier in accordance with Chapter 12.

Column 16 can be used for explanatory notes. A number can be entered in this field which corresponds to a list of notes which provide additional information on the seismic evaluation of equipment. For example, a note could indicate that a solenoid-operated valve is mounted on the yoke of an air-operated valve (AOV) and is evaluated as a component mounted within the "box" of this AOV. This column should also be used to identify when the intent of any caveat and guidelines is met, but the specific wording of the rule is not needed.

13.5 EOUIPMENT SEISMIC EVALUATION REPORTS

The Equipment Seismic Evaluation Report (ESER) should summarize the equipment seismic evaluations which result from applying the procedures in the DOE Seismic Evaluation Procedure. The following information should be documented in the ESER:

- Resumes of the SCEs in the SRT.
- Description of the seismic design basis of the facility, description of the seismic demand of
 the facility including the design basis earthquake (DBE), identification of the performance
 category and function of the facility, description of the site characteristics, and basis for
 establishing the degree of uncertainty in the natural frequency of the building structure if
 unbroadened response spectra are used with frequency shifting of response peaks.
- List of systems and components in the SEL.
- Screening Evaluation and Walkdown documentation including the SEWS, OSES and SEDS.
- Notes, photographs, drawings, calculations, assumptions, and judgments, as appropriate, used to justify the Screening Evaluation and Walkdown.

⁵ Based on Section 9.4 of SQUG GIP (Ref. 1)

- Results of the Screening Evaluation and Walkdown for equipment on the SEDS forms, including descriptions of any cases which specific caveats and guidelines are met by intent without meeting the specific wording of the caveat rule.
- Description of outliers on OSES and SEWS forms and explanations of the safety and operation implications of not resolving these outliers.
- Results of engineering evaluations, tests, calculations, equipment modifications, and equipment replacements as well as a proposed schedule to resolve outliers.
- Description of significant or programmatic deviations from the DOE Seismic Evaluation Procedure.

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 $(x_1,\dots,x_n)_{X\in X}, (x_1,\dots,x_n)_{X\in X} \in \mathcal{C}_{X}$

SEWS 8.1.1 (1 of 4)

Sheet 1 of _____

SCREENING EVALUATION	N WORK SHEET (SEV	VS)		
Equipment ID No.:	Equipment Class: Batte	ries on	Racks	
Equipment description:			···	
System:		T		
Equipment Location: Bldg.	Floor El.	Room	, Row/Co	1.
Manufacturer, model, etc.:	<u> </u>	<u>,,</u>		
Battery type:	Individual Battery Weight	:		
Drawing No.:	Performance Category:			
Functionality Requirement				
Contact Lead Relay Reviewer to determine if item For components whose function or structural integ For all other components, only anchorage evaluations.	grity is required, complete a	Il section	ns of this	form.
Seismic Capacity vs. Demand (Chapter 5)				
Seismic Capacity based on: Reference Spectrum GERS Existing documentation Elevation where equipment receives seismic in Seismic Demand Spectrum (SDS) based on: In-structure response spectrum Other in-structure response spectrum scale factor) Design basis earthquake (DBE Other	n (IRS) per DOE-STD-1020 ectrum (determine appropri	ate expe	erience da	ıta
, ,	perience Data Factor (F _{ED})			
Does capacity exceed demand?		Y	ı u	
Reference:				
Caveats (Section 8.1.1)				_
Reference Spectrum (Identify with an asterisk (*) t meeting the specific wording of the caveat rule and exp COMMENTS section below)	hose caveats which are me plain the reason for this cond	t by inte clusion i	nt without n the	
Equipment is included in earthquake experience Plates of the cells are lead-calcium flat-plate, P Manchex design			U V	N/A N/A
3. Each individual battery weighs less than 450 lb		-	V U	N/A
4. Close-fitting, crush-resistant spacers fill two-thi vertical space between cells	ras of	Y I	N U	N/A
5. Cells restrained by end and side rails		ΥI	N U	N/A

SEWS 8.1.1 (2 of 4)

Sheet 2 of _____

	ment ID No.: Equipment Class: B	atteries	on Ra	cks	
Equip	ment description:				
					
90.000 N	eats (Cont.)	Υ	N.I	U	N/A
3. -	Racks have longitudinal cross bracing	Ϋ́Υ	N N	U	N/A N/A
' .	Wood racks evaluated to industry accepted standards Batteries greater than 10 years old specifically evaluated	1	14	U	IN/A
3.	for aging effects	Υ	N	U	N/A
) .	Have you looked for and found no other adverse concerns?	Ÿ	N	ŭ	N/A
s the	intent of all the caveats met for Reference Spectrum?	Y	N	U	N/A
3EF vordi	(Identify with an asterisk (*) those caveats which are met by intent with any of the caveat rule and explain the reason for this conclusion in the COI	out meet	ing the S section	e spec on bel	ific ow)
l.	Equipment is included in generic seismic testing equipment class	Y	N	U	N/A
ı. 2.	Meets all Reference Spectrum caveats	Ý	N	Ü	N/A
2. 3.	Plates of the cells are lead-calcium flat-plate design	·		_	
.	(i.e., not Manchex design)	Υ	Ν	U	N/A
1 .	Batteries supported on two-step racks or single-tier racks;				
••	restrained by double side and end rails which are symmetrically				
	located with respect to the cell center-of-gravity	Y	N	U	N/A
s the	intent of all the caveats met for GERS?	Υ	N	U	N/A
Anc	horage (Chapter 6)				
	horage (Chapter 6) Type of anchorage:				
	Type of anchorage: expansion anchor				
	Type of anchorage:				
	Type of anchorage: expansion anchor				
	Type of anchorage:				
	Type of anchorage:				
	Type of anchorage:				
	Type of anchorage: expansion anchor cast-in-place bolt or headed stud anchor cast-in-place J-bolt grouted-in-place bolt welds to embedded steel on exposed steel lead cinch anchors Other				
	Type of anchorage:				
	Type of anchorage:				
1.	Type of anchorage:	Y	N	U	
1.	Type of anchorage:	Υ	Ν	U	N/A
2. 3. 4.	Type of anchorage:	Y	N N	· U	N/A
2. 3. 4. 5.	Type of anchorage:	Y Y Y	N N N	U	
2. 3. 4. 5. 6.	Type of anchorage: expansion anchor	Y Y Y	N N N	. U U U	N/A
2. 3. 4. 5. 6. 7.	Type of anchorage: expansion anchor	Y Y Y Y	N N N N	U U U U	
2. 3. 4. 5. 6.	Type of anchorage: expansion anchor	Y Y Y	N N N	. U U U	

SEWS 8.1.1 (3 of 4)

Sheet 3 of _____

quip	ment ID No.: Equ	<u> ipment Class: Batteries</u>	on R	acks	
quip	ment description:				
Incl	iorage (Cont.)				
1.	Concrete crack requirements met	Υ	N	U	
2.	Equipment with essential relays requirements met	Y	N	U	N/A
3.	Installation adequacy requirements met	Y	N N	U	N/A
4.	No other concerns	Y	IN	U	
oes	anchorage capacity exceed demand?	Y	N	U	
efer	ence:				
	action Effects (Chapter 7)				
•	Soft targets free from impact by nearby equipment	.,	• •		
	or structures If equipment contains sensitive essential relays, equipment contains essential relays, equipment contains essential relays, equipment contains essential relays, equipment essential relays, essential relays, equipment essential relays, equipment essential relays	Y	N	U	N/A
•	from all impact by nearby equipment or structures	Y	N	U	N/A
	Attached lines have adequate flexibility	Ý	N	Ü	N/A
	No collapse of overhead equipment, distribution systematical systemati	ems,		-	,
	or masonry walls	Υ	N		N/A
	Equipment is free from credible and significant				
	seismic-induced flood and spray concerns	Y	N		N/A
	No credible seismic-induced fire concerns No other "two over one" concerns as defined in DOE-	Y STD-1021 Y	N N		N/A N/A
•	No other concerns	Y	N	U	N/A
•		Y	N	U	
equ	ipment free of interaction effects?	Ť	IN	U	
on	ments				
	•				

SEWS 8.1.1 (4 of 4)

Sheet 4 of _____

Equipment ID	No.:		Equipment Class: Batteries on Racks	
Equipment desc	cription:			
Comments (Cont.)			
Screening Walk	down(s):			
<u>Date</u>	Time	Team Members	<u>s</u>	
Recommend	l Resolution			
	d Resolution			
☐ Mainte				
☐ Maintel ☐ Further	nance action:			
□ Maintel □ Further □ Retrofit	nance action:			
☐ Maintel ☐ Further ☐ Retrofit ☐ Other:	nance action: evaluation: design:			
☐ Maintel ☐ Further ☐ Retrofit ☐ Other:	nance action: evaluation: design:	Equipment is seism		
□ Maintel □ Further □ Retrofit □ Other: □ No furt	nance action: evaluation: design: mer action required.		ically adequate.	
□ Maintel □ Further □ Retrofit □ Other: □ No furt	nance action: evaluation: design: ner action required. ne equipment's seisi	Equipment is seism	ically adequate.	
□ Maintel □ Further □ Retrofit □ Other: □ No furt All aspects of the	nance action: evaluation: design: ner action required. ne equipment's seismores)	Equipment is seism	ically adequate. Deen addressed. Date:	
□ Maintel □ Further □ Retrofit □ Other: □ No furt All aspects of the Evaluation by:	nance action: evaluation: design: ner action required. ne equipment's seismores)	Equipment is seism	ically adequate. Deen addressed. Date:	

SEWS 8.1.2 (1 of 4)

Sheet 1 of _____

SCREENING EVALUA	ATION WORK SHEET (S	EWS)			
Equipment ID No.:	Equipment Class: M	lotor Co	ntrol (Center	'S
Equipment description:			· · · · · · · · · · · · · · · · · · ·		
Equipment Location: Bldg.	Floor El.	Ro	om, R	ow/Co	<u>l.</u>
Manufacturer, model, etc.:					
Weight of each Cabinet:					
Drawing No.:	Performance Catego	ry:			iioktoo
Functionality Requirement					
Contact Lead Relay Reviewer to determine For components whose function or structur For all other components, only anchorage	ral integrity is required, comple evaluation is required.	-	ctions	of this	form.
Seismic Capacity vs. Demand (Chapter 5					
Other in-structure response scale factor) Design basis earthquake Other	d on: hectrum (IRS) per DOE-STD-10 nse spectrum (determine appro	opriate e	xperie	nce da	ıta
Scale Factor (SF)	Experience Data Factor (F				
Does capacity exceed demand?		Υ	N	U	
Reference:					
Caveats (Section 8.1.2)					
Reference Spectrum (Identify with an asterimeeting the specific wording of the caveat rule a COMMENTS section below)	sk (*) those caveats which are nd explain the reason for this o	met by i	intent v	without e	t
1. Equipment is included in earthquake exp	perience equipment class	Y	N	U	N/A
 600 V rating or less Adjacent cabinets which are close enough 	gh to impact, or sections	Y	N	U	N/A
of multi-bay cabinets, are bolted togeth		V	K I	U	N/A
essential relays 4. Attached weight (except conduit) less the	an about 100 lbs per	Y	N		
cabinet assembly		Y Y	N N	U U	N/A N/A
5. Externally attached items rigidly anchore		T	- IN		IN/A

SEWS 8.1.2 (2 of 4)

Sheet 2 of _____

Equ	ipment ID No.: Equipment Class: N	lotor Co	ntrol	<u>Cente</u>	rs
Equi	pment description:				
	/eats (Cont.)				
6.	General configuration similar to NEMA standards	Υ	N	U	N/A
7.	Cutouts in lower half less than 6 in. wide and 12 in. high	Y	N	U	N/A
8.	All doors secured by latch or fastener	Y	N	U	N/A
9.	Have you looked for and found no other adverse concerns?	Y	N	U	N/A
s the	e intent of all the caveats met for Reference Spectrum?	Υ	N	U	N/A
	RS (Identify with an asterisk (*) those caveats which are met by intent with				
	ting of the caveat rule and explain the reason for this conclusion in the CO				
1.	Equipment is included in generic seismic testing equipment class	Y	N	U	N/A
2.	Meets all Reference Spectrum caveats	Y	N	U	N/A
3.	Floor-mounted cabinet	Y	N	U	N/A
4. -	Average weight per section less than 800 pounds	Y	N	U	N/A
5.	Base anchorage utilizing MCC base channels	Y	N	U	N/A
6.	Adequate strength and stiffness in load transfer path from	V	B.1		81/A
_	anchorage to base frame (only for "function after" GERS)	Y	N	U	N/A
7.	Essential relays have GERS > 4.5g (only for "function		V	NI.	U N/A
0	during" GERS)	Υ	Y N	N	N/A
B.	Able to reset starters (only for "function after" GERS)	Ť	IN	U	N/A
9.	Adjacent cabinets which are close enough to impact, or sections of	Υ	N	U	N/A
	multi-bay cabinets, are bolted together.	T	IN	U	IN/A
ls th	e intent of all the caveats met for GERS?	Υ	N	U	N/A
		•	. •	_	
And	chorage (Chapter 6)				
	c horage (Chapter 6) Type of anchorage:				
	Type of anchorage:				
	Type of anchorage: expansion anchor				
	Type of anchorage: expansion anchor cast-in-place bolt or headed stud anchor				
	Type of anchorage: expansion anchor cast-in-place bolt or headed stud anchor cast-in-place J-bolt				
	Type of anchorage: expansion anchor cast-in-place bolt or headed stud anchor cast-in-place J-bolt grouted-in-place bolt welds to embedded steel on exposed steel				
A nd	Type of anchorage: expansion anchor cast-in-place bolt or headed stud anchor cast-in-place J-bolt grouted-in-place bolt welds to embedded steel on exposed steel lead cinch anchors				
	Type of anchorage: expansion anchor cast-in-place bolt or headed stud anchor cast-in-place J-bolt grouted-in-place bolt welds to embedded steel on exposed steel				
	Type of anchorage: expansion anchor cast-in-place bolt or headed stud anchor cast-in-place J-bolt grouted-in-place bolt welds to embedded steel on exposed steel lead cinch anchors Other				
1.	Type of anchorage:	Y	N	U	
1.	Type of anchorage:	Υ	Ν	U	N/A
2.	Type of anchorage:	Y Y	N N	U	N/A
2. 3.	Type of anchorage:	Y Y Y	N N N	U U	
2. 3. 4.	Type of anchorage:	Y Y Y	N N N N	U U U	N/A N/A
2. 3. 4. 5.	Type of anchorage:	Y Y Y Y	2 2 2 2 2	U U U	
2. 3. 4. 5.	Type of anchorage: expansion anchor	Y Y Y Y	2 2 2 2 2	U U U U	
2. 3. 4. 5. 6. 7.	Type of anchorage: expansion anchor	Y Y Y Y	2 2 2 2 2	U U U	

SEWS 8.1.2 (3 of 4)

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Anchorage (cont.) 1. Concrete crack requirements met 2. Equipment with essential relays requirements met 3. Installation adequacy requirements met 4. No other concerns 4. No other concerns 5. Oces anchorage capacity exceed demand? 6. Soft targets free from impact by nearby equipment or structures 6. If equipment contains sensitive essential relays, equipment free from all impact by nearby equipment or structures 7. No UN/A 6. Attached lines have adequate flexibility 7. No UN/A 6. Equipment is free from credible and significant seismic-induced flood and spray concerns 7. No other "two over one" concerns as defined in DOE-STD-1021 7. No other concerns 7. No UN/A 7. No other concerns 7. No UN/A 8. Requipment free of interaction effects? 7. No UN/A 8. Requipment free of interaction effects? 7. No UN/A 8. Requipment free of interaction effects? 8. No credible seismic-induced fire concerns 9. No UN/A 9. No other "two over one" concerns as defined in DOE-STD-1021 9. No UN/A 9. Requipment free of interaction effects? 9. No UN/A 9. No other concerns 9. No UN/A 9. No UN/A 9. No other concerns 9. No UN/A 9.	Equipment ID No.:	Equipment Class:	Motor Co	ntrol	Cente	rs
1. Concrete crack requirements met 2. Equipment with essential relays requirements met 3. Installation adequacy requirements met 4. No other concerns 4. No other concerns 4. No other concerns 5. Soft targets free from impact by nearby equipment 6. or structures 6. Attached lines have adequate flexibility 7. No collapse of overhead equipment, distribution systems, 7. Or masonry walls 7. Sequipment is free from credible and significant 8. No credible seismic-induced flood and spray concerns 8. No credible seismic-induced fire concerns 9. No other "two over one" concerns as defined in DOE-STD-1021 9. No other concerns 9. No U N/A 9. No U N/	Equipment description:					
1. Concrete crack requirements met 2. Equipment with essential relays requirements met 3. Installation adequacy requirements met 4. No other concerns 4. No other concerns 4. No other concerns 5. Soft targets free from impact by nearby equipment 6. or structures 6. Attached lines have adequate flexibility 7. No collapse of overhead equipment, distribution systems, 7. Or masonry walls 7. Sequipment is free from credible and significant 8. No credible seismic-induced flood and spray concerns 8. No credible seismic-induced fire concerns 9. No other "two over one" concerns as defined in DOE-STD-1021 9. No other concerns 9. No U N/A 9. No U N/	Anchorage (Cont.)					
Interaction Effects (Chapter 7) 1. Soft targets free from impact by nearby equipment or structures Y N U N/A 2. If equipment contains sensitive essential relays, equipment free from all impact by nearby equipment or structures Y N U N/A 3. Attached lines have adequate flexibility Y N U N/A 4. No collapse of overhead equipment, distribution systems, or masonry walls Y N N/A 5. Equipment is free from credible and significant seismic-induced flood and spray concerns Y N N/A 5. No credible seismic-induced fire concerns Y N N/A 7. No other "two over one" concerns as defined in DOE-STD-1021 Y N N/A 8. No other concerns Y N U N/A 9. Sequipment free of interaction effects?	 Equipment with essential relays requirements. Installation adequacy requirements met No other concerns Does anchorage capacity exceed demand?		Y Y Y	N N N	U U	
Soft targets free from impact by nearby equipment or structures Y N U N/A If equipment contains sensitive essential relays, equipment free from all impact by nearby equipment or structures Y N U N/A Attached lines have adequate flexibility Y N U N/A No collapse of overhead equipment, distribution systems, or masonry walls Y N N/A Equipment is free from credible and significant seismic-induced flood and spray concerns Y N N/A No credible seismic-induced fire concerns Y N N/A No other "two over one" concerns as defined in DOE-STD-1021 Y N N/A s equipment free of interaction effects? Y N U						
from all impact by nearby equipment or structures Attached lines have adequate flexibility No collapse of overhead equipment, distribution systems, or masonry walls Equipment is free from credible and significant seismic-induced flood and spray concerns No credible seismic-induced fire concerns No other "two over one" concerns as defined in DOE-STD-1021 No other concerns Y N U N/A Sequipment free of interaction effects? Y N U	 Soft targets free from impact by nearby equi or structures 		Y	N	U	N/A
Equipment is free from credible and significant seismic-induced flood and spray concerns YNNN/A No credible seismic-induced fire concerns YNNN/A No other "two over one" concerns as defined in DOE-STD-1021 YNNN/A No other concerns YNNUN/A s equipment free of interaction effects? YNU	from all impact by nearby equipment or sta 3. Attached lines have adequate flexibility 4. No collapse of overhead equipment, distribu	ructures	Y	N		N/A
3. No other concerns Y N U N/A s equipment free of interaction effects? Y N U	 Equipment is free from credible and signification seismic-induced flood and spray concerns 		Y	N		N/A
		d in DOE-STD-1021	-		U	
Comments	s equipment free of interaction effects?		Y	N	U	
	Comments					

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Sheet 4 of _____

Earlie	ment ID No.:			Equipment Class: Motor	Control Centers
	ment descriptio	n.		Liquipment Olass. Motor	Control Centers
	ments (Cont.,				
				are recorded to a management of the contract o	
Scree	ning Walkdown		To a see Managhan	_	
	<u>Date</u>	<u>Time</u>	Team Member	<u>'S</u>	
					•
<i>-</i>	omend Re	Salution			
	ommend Re				
Rec	ommend Re Maintenance				
		e action:			
0	Maintenance	e action:			
0 0 0	Maintenance Further evalue Retrofit design	e action:			
0 0 0	Maintenance Further evalue Retrofit design	e action: uation: gn:			
0 0 0	Maintenance Further evalue Retrofit design	e action: uation: gn:	Equipment is seisn	nically adequate.	
0 0 0 0	Maintenance Further evalue Retrofit design Other: No further ac	e action: uation: gn: ction required.		and the state of t	
C C C All as	Maintenance Further evalue Retrofit design Other: No further accepted of the equipment of t	e action: uation: gn: ction required. uipment's seis	mic adequacy have	been addressed.	Date:
All as	Maintenance Further evalue Retrofit design Other: No further ac	e action: uation: gn: ction required. uipment's seis	mic adequacy have	and the state of t	Date:
All as	Maintenance Further evaluation by:	e action: uation: gn: ction required. uipment's seis	mic adequacy have	been addressed.	_ Date:

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SCREENING EVALUATION V	VORK SHEET (SEW	/S)			
Equipment ID No.:	Equipment Class: Low-Voltage Switchgear				
Equipment description:					
Equipment Location: Bldg. F	loor El.	Room, F	Row/Co	١.	
Manufacturer, model, etc.:					
Weight of each Cabinet:					
Drawing No.:	erformance Category:				
Functionality Requirement					
 Contact Lead Relay Reviewer to determine if item co For components whose function or structural integrity For all other components, only anchorage evaluation 	is required, complete al	l sections	of this	form.	
Seismic Capacity vs. Demand (Chapter 5)					
 Seismic Capacity based on: Reference Spectrum GERS Existing documentation Elevation where equipment receives seismic input Seismic Demand Spectrum (SDS) based on: In-structure response spectrum (IF Other in-structure response spectr scale factor) Design basis earthquake (DBE) per Other Scale Factor (SF) Experimentation Experimentation Design basis earthquake (DBE) per Design basis earthquake Experimentation Other Experimentation Experimentation	RS) per DOE-STD-1020 um (determine appropria er DOE-STD-1020	ite experie	ence da	ıta	
Does capacity exceed demand?		Y N	U		
Reference: Caveats (Section 8.1.3) Reference Spectrum (Identify with an asterisk (*) thos meeting the specific wording of the caveat rule and explain COMMENTS section below)					
Equipment is included in earthquake experience experience.	quipment class	Y N	U	N/A	
2. 600 V rating or less	م معمد بأطوط	Y N	U	N/A	
 Side-to-side restraint of draw-out circuit breakers is Adjacent cabinets which are close enough to impa 		Y N	U	N/A	
 Adjacent cabinets which are close enough to impa multi-bay cabinets, are bolted together if they co Attached weight (except conduit) less than about 1 	ntain essential relays	Y N	U	N/A	
assembly	-	Y N	U	N/A	
 6. Externally attached items rigidly anchored 7. General configuration similar to ANSI C37.20 stan 	dards	Y N Y N	U	N/A N/A	

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Sheet 2 of _____

<u></u>	SCREENING EVALUATION WORK SHEE	-1 (02110) (00			
Equip	ment ID No.: Equipmen	t Class: Low-Volt	age S	witchg	jear
Equip	ment description:	vasaineiskaals valt sareakeisel			
Cave	eats (Cont.)				
8.	Cutouts in lower half of cabinet side sheathing less than 30%				
	width of side panel wide and less than 60% of width of side	y panei Y	N	U	N/A
_	excluding bus transfer compartment	Ϋ́Υ	N	U	N/A
9.	All doors secured by latch or fastener Have you looked for and found no other adverse concerns?	Ý	N	Ü	N/A
0.	Have you looked for and found no other adverse concerns?	r	IN	U	IVA
Is the intent of all the caveats met for Reference Spectrum?			N	U	N/A
GER	S (Identify with an asterisk (*) those caveats which are met by	intent without mee	ting the	e spec	ific
	ng of the caveat rule and explain the reason for this conclusion	in the COMMENT	S secti	on bel	
1.	Equipment is included in generic seismic testing equipment of	class Y	N	U	N/A
2.	Meets all Reference Spectrum caveats	Y	N N	U	N/A N/A
3.	Floor-mounted enclosure		IN	U	IN/A
4.	Manufactured by major vendor (ITE/Brown Boveri, Westingh	ouse, Y	N	U	N/A
_	or GE) Average weight per section less than 1,600 lbs	Ÿ	N	Ŭ	N/A
5. 6.	For 2.5g level GERS, vertical restraint prevents breaker uplif		Ň	ŭ	N/A
7.	For 2.5g level GERS, outside corners of end units are	•			
•	reinforced, if needed	Υ	Ν	U	N/A
8.	Adjacent cabinets which are close enough to impact, or sect	ions of Y			
multi-bay cabinets, are bolted together			N	U	N/A
s the	intent of all the caveats met for GERS?	Y	N	U	N/A
	horage (Chapter 6)				
1.	Type of anchorage:				
	expansion anchor				
	cast-in-place bolt or headed stud anchor				
	cast-in-place bolt or headed stud anchorcast-in-place J-bolt				
	·				
	cast-in-place J-boltgrouted-in-place bolt				
	 cast-in-place J-bolt grouted-in-place bolt welds to embedded steel on exposed steel 				
	 cast-in-place J-bolt grouted-in-place bolt welds to embedded steel on exposed steel lead cinch anchors 				
	 cast-in-place J-bolt grouted-in-place bolt welds to embedded steel on exposed steel 				
	 cast-in-place J-bolt grouted-in-place bolt welds to embedded steel on exposed steel lead cinch anchors Other N/A (no further anchorage considerations) 				
2.	cast-in-place J-bolt grouted-in-place bolt welds to embedded steel on exposed steel lead cinch anchors Other N/A (no further anchorage considerations) Appropriate characteristics for anchorage type checked				
	cast-in-place J-bolt grouted-in-place bolt welds to embedded steel on exposed steel lead cinch anchors Other N/A (no further anchorage considerations) Appropriate characteristics for anchorage type checked (size, location, equipment characteristics)	Y	N	U	NI/A
3.	cast-in-place J-bolt grouted-in-place bolt welds to embedded steel on exposed steel lead cinch anchors Other N/A (no further anchorage considerations) Appropriate characteristics for anchorage type checked (size, location, equipment characteristics) Gap at threaded anchor less than 1/4 inch	Υ	Ν	U	N/A
3. 4.	cast-in-place J-bolt grouted-in-place bolt welds to embedded steel on exposed steel lead cinch anchors Other N/A (no further anchorage considerations) Appropriate characteristics for anchorage type checked (size, location, equipment characteristics) Gap at threaded anchor less than 1/4 inch Base stiffness and no significant prying action requirements	met Y	N N	U	N/A
3. 4. 5.	cast-in-place J-bolt grouted-in-place bolt welds to embedded steel on exposed steel lead cinch anchors Other N/A (no further anchorage considerations) Appropriate characteristics for anchorage type checked (size, location, equipment characteristics) Gap at threaded anchor less than 1/4 inch Base stiffness and no significant prying action requirements Equipment base strength and structural load path adequate	met Y Y	N N N	U U	
3. 4. 5. 6.	☐ cast-in-place J-bolt ☐ grouted-in-place bolt ☐ welds to embedded steel on exposed steel ☐ lead cinch anchors ☐ Other ☐ N/A (no further anchorage considerations) Appropriate characteristics for anchorage type checked (size, location, equipment characteristics) Gap at threaded anchor less than 1/4 inch Base stiffness and no significant prying action requirements Equipment base strength and structural load path adequate Embedment steel and pads requirements met	met Y Y Y Y	N N N	U U U	N/A N/A
3. 4. 5. 6. 7.	cast-in-place J-bolt grouted-in-place bolt welds to embedded steel on exposed steel lead cinch anchors Other N/A (no further anchorage considerations) Appropriate characteristics for anchorage type checked (size, location, equipment characteristics) Gap at threaded anchor less than 1/4 inch Base stiffness and no significant prying action requirements Equipment base strength and structural load path adequate Embedment steel and pads requirements met Embedment length requirements met	met	N N N	טטטט	
3. 4. 5. 6. 7. 8.	cast-in-place J-bolt grouted-in-place bolt welds to embedded steel on exposed steel lead cinch anchors Other N/A (no further anchorage considerations) Appropriate characteristics for anchorage type checked (size, location, equipment characteristics) Gap at threaded anchor less than 1/4 inch Base stiffness and no significant prying action requirements Equipment base strength and structural load path adequate Embedment steel and pads requirements met Embedment length requirements met Anchor spacing requirements met	met	N N N N N N	ט ט ט ט ט	
3. 4. 5. 6. 7.	cast-in-place J-bolt grouted-in-place bolt welds to embedded steel on exposed steel lead cinch anchors Other N/A (no further anchorage considerations) Appropriate characteristics for anchorage type checked (size, location, equipment characteristics) Gap at threaded anchor less than 1/4 inch Base stiffness and no significant prying action requirements Equipment base strength and structural load path adequate Embedment steel and pads requirements met Embedment length requirements met	met	N N N	טטטט	

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Anchorage (Cont.) 11. Concrete crack requirements met 12. Equipment with essential relays requirements met 13. Installation adequacy requirements met 14. No other concerns Does anchorage capacity exceed demand? Reference:	Y Y Y Y	N N N N	U U U	N/A N/A
Anchorage (Cont.) 11. Concrete crack requirements met 12. Equipment with essential relays requirements met 13. Installation adequacy requirements met 14. No other concerns Does anchorage capacity exceed demand? Reference:	Y Y Y	N N N	U	
11. Concrete crack requirements met 12. Equipment with essential relays requirements met 13. Installation adequacy requirements met 14. No other concerns Does anchorage capacity exceed demand? Reference:	Y Y Y	N N N	U	
13. Installation adequacy requirements met 14. No other concerns Does anchorage capacity exceed demand? Reference:	Y	N N	U	
14. No other concerns Does anchorage capacity exceed demand? Reference:	Y	N		N/A
Does anchorage capacity exceed demand? Reference:	•		U	
Reference:	Y	Ν		
			U	
Interaction Effects (Chapter 7)				
1. Soft targets free from impact by nearby equipment	.,			.
or structures	Y	N	U	N/A
If equipment contains sensitive essential relays, equipment from all impact by nearby equipment or structures	y Y	N	U	N/A
3. Attached lines have adequate flexibility	Ý	N	Ŭ	N/A
No collapse of overhead equipment, distribution systems	,			
or masonry walls	Y	N		N/A
5. Equipment is free from credible and significant				
seismic-induced flood and spray concerns	Y	N		N/A
 No credible seismic-induced fire concerns No other "two over one" concerns as defined in DOE-ST 	Y D-1021 Y	N N		N/A N/A
 No other "two over one" concerns as defined in DOE-ST No other concerns 	D-1021 Y	N	U	N/A
	· Y	N	U	1471
s equipment free of interaction effects?	1	IN	U	
Comments			Parago Parago	

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Equipm	ent ID No.:			Equipment Class: Low-Voltage Switchgea	ır
Equipme	ent ID No.:)•		Legalyment Glass. Low-voltage Switchiges	<u> </u>
	ent description ents (Cont.)				
	ng Walkdown(
	<u>Date</u>	Time	Team Members	i	
Recon	nmend Res	solution			
	n mend Res Maintenance				
0		action:			
0	Maintenance	action:			
_ _ _	Maintenance Further evalua Retrofit design	action:			
o o o	Maintenance of Further evaluate Retrofit design Other:	action: ation: n:			
_ _ _	Maintenance of Further evaluated Retrofit design Other: No further act	action: ation: n: tion required.	Equipment is seismin		
_ _ _	Maintenance of Further evaluated Retrofit design Other: No further act	action: ation: n: tion required.	Equipment is seismin mic adequacy have b	peen addressed.	
☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐	Maintenance Further evaluate Retrofit design Other: No further act acts of the equition by:	action: ation: n: tion required.	mic adequacy have b	peen addressed. Date:	
☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐	Maintenance Further evalua Retrofit design Other: No further act	action: ation: n: tion required.	mic adequacy have b	peen addressed.	
☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐	Maintenance Further evaluate Retrofit design Other: No further act acts of the equition by:	action: ation: n: tion required.	mic adequacy have b	peen addressed. Date:	

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Sheet	1	of	
Sneet	1	OĪ	

Equipment ID No.: Equipment description: Equipment Location: Bldg. Floor El. Room, Row/Col. Manufacturer, model, etc.: Weight of each cabinet: Drawing No.: Performance Category: Functionality Requirement Contact Lead Relay Reviewer to determine if item contains Essential Relays For components whose function or structural integrity is required, complete all sections of this form. For all other components, only anchorage evaluation is required. Seismic Capacity vs. Demand (Chapter 5) 1. Seismic Capacity based on: Reference Spectrum Reference Spectrum (SDS) based on: Seismic Demand Spectrum (SDS) based on: Capacity experience data scale factor) Design basis earthquake (DBE) per DOE-STD-1020 Other in-structure response spectrum (determine appropriate experience data scale factor) Design basis earthquake (DBE) per DOE-STD-1020 Other Scale Factor (SF) Experience Data Factor (F _{ED}) Does capacity exceed demand? Reference: Cayeats (Section 8.1.4) Reference Spectrum (Identify with an asterisk (*) those caveats which are met by intent without meeting the specific wording of the caveat rule and explain the reason for this conclusion in the COMMENT'S section below) 1. Equipment is included in earthquake experience equipment class Y N U N/A 2. 2.4 kV to 4.16 kV rating 3. Internally mounted potential and/or control power transformers are restrained to prevent damage to or disconnection of contacts Y N U N/A 4. Adjacent cabinets which are olose enough to impact, or sections of multi-bay cabinets, are botted together if they contain essential relays Y N U N/A 4. Adjacent cabinets which are close enough to impact, or sections of multi-bay cabinets, are botted together if they contain essential relays Y N U N/A 4. Adjacent cabinets which are close enough to impact, or sections of multi-bay cabinets, are botted together if they contain essential relays Y N U N/A	SCREENING EVALUATION	WORK SHEET (SEV	VS)			
Equipment Location: Bidg. Floor El. Room, Row/Col. Manufacturer, model, etc.: Weight of each cabinet: Drawing No.: Performance Category: Functionality Requirement Contact Lead Relay Reviewer to determine if item contains Essential Relays For components whose function or structural integrity is required, complete all sections of this form. For all other components, only anchorage evaluation is required. Seismic Capacity vs. Demand (Chapter 5) Seismic Capacity based on: Reference Spectrum GERS Seismic Demand Spectrum (SDS) based on: In-structure responses spectrum (determine appropriate experience data scale factor) Seismic Demand Spectrum (SDS) based on: In-structure responses spectrum (determine appropriate experience data scale factor) Design basis earthquake (DBE) per DOE-STD-1020 Other in-structure response spectrum (determine appropriate experience data scale factor) Scale Factor (SF) Experience Data Factor (F _{ED}) Does capacity exceed demand? Reference: Caveats (Section 8.1.4) Reference Spectrum (Identify with an asterisk (*) those caveats which are met by intent without meeting the specific wording of the caveat rule and explain the reason for this conclusion in the COMMENTS section below) 1. Equipment is included in earthquake experience equipment class Y N U N/A 2. 2. 4 kV to 4.16 kV rating CALIFICATION OF THE ADD OF THE A	Equipment ID No.:	Equipment Class: Medi	um-V	oltag	e Swit	chgear
Manufacturer, model, etc.: Weight of each cabinet: Drawing No.: Performance Category: Functionality Requirement Contact Lead Relay Reviewer to determine if item contains Essential Relays For components whose function or structural integrity is required, complete all sections of this form. For all other components, only anchorage evaluation is required. Seismic Capacity vs. Demand (Chapter 5) 1. Seismic Capacity based on: Reference Spectrum Reference Spectrum (SDS) based on: Reference Spectrum (SDS) based on: Reference Spectrum (GDS) based on: Reference Spectrum (GDBC) per DOE-STD-1020 Does capacity exceed demand? Y N U N/A 1. Equipment is included in earthquake experience equipment class Y N U N/A 2. 2.4 kV to 4.16 kV rating 3. Internally mounted potential and/or control power transformers are restrained to prevent damage to or disconnection of contacts Y N U N/A 4. Adjacent cabinets which are close enough to impact, or sections of multi-bay cabinets, are botted together if they contain essential relays Y N U N/A 4. Adjacent cabinets which are close enough to impact, or sections of multi-bay cabinets, are botted together if they contain essential relays Y N U N/A	Equipment description:	·				
Weight of each cabinet: Drawing No.: Performance Category: Functionality Requirement Contact Lead Relay Reviewer to determine if item contains Essential Relays For components whose function or structural integrity is required, complete all sections of this form. For all other components, only anchorage evaluation is required. Seismic Capacity vs. Demand (Chapter 5) 1. Seismic Capacity based on: Reference Spectrum Reference Spectrum Reference Spectrum (SDS) based on: Reference Spectrum (SDS) based on: Reference Spectrum (GBS) per DOE-STD-1020 Chher in-structure response spectrum ((RS) per DOE-STD-1020 Chher in-structure response spectrum (determine appropriate experience data scale factor) Design basis earthquake (DBE) per DOE-STD-1020 Chter Scale Factor (SF) Experience Data Factor (F _{ED}) Does capacity exceed demand? Reference: Caveats (Section 8.1.4) Reference Spectrum (Identify with an asterisk (*) those caveats which are met by intent without meeting the specific wording of the caveat rule and explain the reason for this conclusion in the COMMENTS section below) 1. Equipment is included in earthquake experience equipment class Y N U N/A 2. 2.4 kV to 4.16 kV rating 3. Internally mounted potential and/or control power transformers are restrained to prevent damage to or disconnection of contacts Y N U N/A 4. Adjacent cabinets which are close enough to impact, or sections of multi-bay cabinets, are bolted together if they contain essential relays Y N U N/A Attached weight (except conduit) less than about 100 lbs per	Equipment Location: Bldg.	Floor El.	Ro	om, Re	ow/Co	l
Drawing No.: Performance Category:	Manufacturer, model, etc.:					
Contact Lead Relay Reviewer to determine if item contains Essential Relays For components whose function or structural integrity is required, complete all sections of this form. For all other components, only anchorage evaluation is required. Seismic Capacity vs. Demand (chapter 5)	Weight of each cabinet:					
Contact Lead Relay Reviewer to determine if item contains Essential Relays For components whose function or structural integrity is required, complete all sections of this form. For all other components, only anchorage evaluation is required. Seismic Capacity vs. Demand (Chapter 5) 1. Seismic Capacity based on:	Drawing No.:	Performance Category:	\$ 1700 tu		n de la Cata estra Tin la	
For components whose function or structural integrity is required, complete all sections of this form. For all other components, only anchorage evaluation is required. Seismic Capacity vs. Demand (Chapter 5)	Functionality Requirement					
1. Seismic Capacity based on: Reference Spectrum GERS	For components whose function or structural integral For all other components, only anchorage evaluation	rity is required, complete a on is required.	.E.S. (188)	tions o	of this 1	form.
Reference Spectrum GERS Existing documentation 2. Elevation where equipment receives seismic input Seismic Demand Spectrum (SDS) based on: In-structure response spectrum (IRS) per DOE-STD-1020 Other in-structure response spectrum (determine appropriate experience data scale factor) Design basis earthquake (DBE) per DOE-STD-1020 Other Scale Factor (SF) Experience Data Factor (F _{ED}) Does capacity exceed demand? Y N U Reference: Caveats (Section 8.1.4) Reference Spectrum (Identify with an asterisk (*) those caveats which are met by intent without meeting the specific wording of the caveat rule and explain the reason for this conclusion in the COMMENTS section below) 1. Equipment is included in earthquake experience equipment class Y N U N/A 2. 2.4 kV to 4.16 kV rating 3. Internally mounted potential and/or control power transformers are restrained to prevent damage to or disconnection of contacts Y N U N/A 4. Adjacent cabinets which are close enough to impact, or sections of multi-bay cabinets, are bolted together if they contain essential relays Y N U N/A 5. Attached weight (except conduit) less than about 100 lbs per cabinet bay Y N U N/A						
Does capacity exceed demand? Reference:	Reference Spectrum GERS Existing documentation Elevation where equipment receives seismic input Seismic Demand Spectrum (SDS) based on: In-structure response spectrum of Other in-structure response spectrum scale factor) Design basis earthquake (DBE) Other	(IRS) per DOE-STD-1020 ctrum (determine appropria per DOE-STD-1020		kperier	nce da	ta
Reference: Caveats (Section 8.1.4) Reference Spectrum (Identify with an asterisk (*) those caveats which are met by intent without meeting the specific wording of the caveat rule and explain the reason for this conclusion in the COMMENTS section below) 1.		erience Data Factor (F _{ED})		· ·		
Caveats (Section 8.1.4) Reference Spectrum (Identify with an asterisk (*) those caveats which are met by intent without meeting the specific wording of the caveat rule and explain the reason for this conclusion in the COMMENTS section below) 1. Equipment is included in earthquake experience equipment class Y N U N/A 2. 2.4 kV to 4.16 kV rating Y N U N/A 3. Internally mounted potential and/or control power transformers are restrained to prevent damage to or disconnection of contacts Y N U N/A 4. Adjacent cabinets which are close enough to impact, or sections of multi-bay cabinets, are bolted together if they contain essential relays Y N U N/A 5. Attached weight (except conduit) less than about 100 lbs per cabinet bay Y N U N/A	· •		Υ	N	U	
Reference Spectrum (Identify with an asterisk (*) those caveats which are met by intent without meeting the specific wording of the caveat rule and explain the reason for this conclusion in the COMMENTS section below) 1. Equipment is included in earthquake experience equipment class Y N U N/A 2. 2.4 kV to 4.16 kV rating Y N U N/A 3. Internally mounted potential and/or control power transformers are restrained to prevent damage to or disconnection of contacts Y N U N/A 4. Adjacent cabinets which are close enough to impact, or sections of multi-bay cabinets, are bolted together if they contain essential relays Y N U N/A 5. Attached weight (except conduit) less than about 100 lbs per cabinet bay	Reference:					
meeting the specific wording of the caveat rule and explain the reason for this conclusion in the COMMENTS section below) 1. Equipment is included in earthquake experience equipment class Y N U N/A 2. 2.4 kV to 4.16 kV rating Y N U N/A 3. Internally mounted potential and/or control power transformers are restrained to prevent damage to or disconnection of contacts Y N U N/A 4. Adjacent cabinets which are close enough to impact, or sections of multi-bay cabinets, are bolted together if they contain essential relays Y N U N/A 5. Attached weight (except conduit) less than about 100 lbs per cabinet bay Y N U N/A	Caveats (Section 8.1.4)					
 2.4 kV to 4.16 kV rating Internally mounted potential and/or control power transformers are restrained to prevent damage to or disconnection of contacts Adjacent cabinets which are close enough to impact, or sections of multi-bay cabinets, are bolted together if they contain essential relays Attached weight (except conduit) less than about 100 lbs per cabinet bay N U N/A 	meeting the specific wording of the caveat rule and expla					
 2.4 kV to 4.16 kV rating Internally mounted potential and/or control power transformers are restrained to prevent damage to or disconnection of contacts Adjacent cabinets which are close enough to impact, or sections of multi-bay cabinets, are bolted together if they contain essential relays Attached weight (except conduit) less than about 100 lbs per cabinet bay N U N/A 	Equipment is included in earthquake experience	equipment class	Υ	N	U	N/A
restrained to prevent damage to or disconnection of contacts Y N U N/A 4. Adjacent cabinets which are close enough to impact, or sections of multi-bay cabinets, are bolted together if they contain essential relays Y N U N/A 5. Attached weight (except conduit) less than about 100 lbs per cabinet bay Y N U N/A	2. 2.4 kV to 4.16 kV rating		Y	N	U	N/A
multi-bay cabinets, are bolted together if they contain essential relays Y N U N/A 5. Attached weight (except conduit) less than about 100 lbs per cabinet bay Y N U N/A	restrained to prevent damage to or disconnecti	ion of contacts	Υ	N	U	N/A
5. Attached weight (except conduit) less than about 100 lbs per cabinet bay Y N U N/A			Υ	N	υ	N/A
out more any	5. Attached weight (except conduit) less than about					
6. Externally attached items rigidly anchored Y N U N/A	6. Externally attached items rigidly anchored		Y	N	U	N/A N/A

SEWS 8.1.4 (2 of 4)

Equi	oment ID No.: Equ	uipment Class: Medium-\	oltag	je Swi	tchge
Equip	ment description:				
Cav	eats (Cont.)				
7. 8.	General configuration similar to ANSI C37.20 standar Cutouts in lower half of cabinet side sheathing less th width of side panel wide and less than 60% of width	an 30% of	N	U	N/A
	excluding bus transfer compartment	Y	N	u	N/A
9.	All doors secured by latch or fastener	Ý	N	Ü	N/A
10.	Have you looked for and found no other adverse cond		N	Ŭ	N/A
ls the	intent of all the caveats met for Reference Spectrum?	Υ	N	U	N/A
	RS (Identify with an asterisk (*) those caveats which are				
	ng of the caveat rule and explain the reason for this con				
1.	Equipment is included in generic seismic testing equi	•	N	U	N/A
2.	Meets all Reference Spectrum caveats	Y	N	U	N/A
3.	Floor-mounted enclosure	Y Y	N	U	N/A
4.	The switchgear is not a specially-designed type		N	U	N/A
5.	Circuit breakers are truck-mounted type, not jack-up (N	U	N/A
6. -	Average weight per vertical section less than 5,000 lb		N	U	N/A
7. 8.	For 2.5g level GERS, vertical restraint prevents circuiter For 2.5g level GERS, circuit break arc chutes are res		N	U	N/A
	horizontally	Y	Ν	U	N/A
9.	For 2.5g level GERS, a Beaver Type Z relay is not us				
	Westinghouse MV switchgear for the "Y" anti-pump	relay Y	Ν	U	N/A
10.	Separate evaluation of breaker racking mechanism of	ompleted;			
	seismic positioner or sufficient side-to-side restraint		N	U	N/A
11.	Adjacent cabinets which are close enough to impact,	Υ	N	U	N/A
	or sections of multi-bay cabinets, are bolted together	er			
ls the	intent of all the caveats met for GERS?	Υ	N	U	N/A
Anc	horage (Chapter 6)				
1.	Type of anchorage:				
••	expansion anchor				
	cast-in-place bolt or headed stud and	ehor			
	cast-in-place J-bolt	// IOI			
	•				
	grouted-in-place bolt	1			
	welds to embedded steel on exposed	d steel			
	lead cinch anchors				
	Other			<u> </u>	
	N/A (no further anchorage considera	tions)			
2.	Appropriate characteristics for anchorage type check				
	(size, location, equipment characteristics)	Y	N	U	

SEWS 8.1.4 (3 of 4)

Equipmen		K SHEET (SEWS				
	ID No.:	quipment Class: Me	edium-	Voltag	e Swi	tchgear
Equipment	description:					
Anchora	ge (Cont.)					
3. Ga	p at threaded anchor less than 1/4 inch		Υ	N	U	N/A
4. Ba	se stiffness and no significant prying action requ	irements met	Υ	Ν	U	
5. Eq.	uipment base strength and structural load path a	dequate	Υ	Ν	U	
6. Em	bedment steel and pads requirements met		Υ	N	U	N/A
7. Em	bedment length requirements met		Υ	Ν	U	
8. An	chor spacing requirements met		Υ	N	U	
9. Ed	ge distance requirements met		Υ	N	U	
10. Co	ncrete strength requirements met		Υ	Ν	U	
11. Co	ncrete crack requirements met		Υ	Ν	U	
12. Eq	uipment with essential relays requirements met		Υ	N	U	N/A
13. ins	tallation adequacy requirements met		Υ	Ν	U	N/A
	other concerns		Υ	Ν	U	
Does anch	orage capacity exceed demand?		Y	N	U	
Reference:						
Interacti	on Effects (Chapter 7)					
4 Sa	the targets from from impact by poorby oquipment					
	ft targets free from impact by nearby equipment		Υ	N	U	N/A
	r structures	immont froo	1	IN	U	14/74
	quipment contains sensitive essential relays, eq		V	NI.	U	N/A
	rom all impact by nearby equipment or structures	5	Y Y	N N	U	N/A
	ached lines have adequate flexibility	-1	Ť	IN	U	IN/A
	collapse of overhead equipment, distribution sy	stems,	Υ	N.	U	N/A
	or masonry walls		Ť	N	U	IN/A
	uipment is free from credible and significant		v			A1/A
	eismic-induced flood and spray concerns		Y	N	U	N/A
	credible seismic-induced fire concerns	- O 1001	Y	N	U	N/A
7. No	other "two over one" concerns as defined in DC	E-STD-1021	Y	N		N/A
	other concerns		Υ	N	U	N/A
3. N o	nt free of interaction effects?		Υ	N	U	
3. No	nt free of interaction effects?		Y	N	U	

SEWS 8.1.4 (4 of 4)

	SCF	REENING E	EVALUATION W	ORK SHEET (SEWS) (Cont.)
Equip	ment ID No.:			Equipment Class: Mediu	ım-Voltage Switchgear
Equip	ment description				
Com	ments (Cont.)				
Scree	ning Walkdown(s):			
	Date	<u>Time</u>	Team Members	1	
Reco	mmend Res	olution			
۵	Maintenance a	action:			
۵	Further evalua	ution:			
٥	Retrofit design	n:			
	Other:				
۵	No further acti	on required.	Equipment is seismi	cally adequate.	
All asp	pects of the equi	pment's seisr	mic adequacy have b	een addressed.	
Evalua	ation by:	·			Date:
(All tea	am members)				
L					

SEWS 8.1.5 (1 of 4)

equipment ID No.:	Equipment Class: D	istributi	on Pa	nels	
quipment description:					
System:					
quipment Location: Bldg.	Floor El.	Ro	om, R	ow/Co	ol.
lanufacturer, model, etc.:					
/eight of each Panel:					
/all mounted:	Floor mounted:				
rawing No.:	Performance Catego	ry:			
unctionality Requirement					
Seismic Capacity based on: Reference Spectrum GERS Existing documentate					
Elevation where equipment receives	s seismic input				
Elevation where equipment receives Seismic Demand Spectrum (SDS) based in the structure response Other in the structure response scale factor)	s seismic input ased on: se spectrum (IRS) per DOE-STD-10 esponse spectrum (determine appro quake (DBE) per DOE-STD-1020		xperie	nce da	ata
Elevation where equipment receives Seismic Demand Spectrum (SDS) by In-structure respons Other in-structure rescale factor) Design basis earthq Other	s seismic input ased on: se spectrum (IRS) per DOE-STD-10 esponse spectrum (determine appro quake (DBE) per DOE-STD-1020	opriate e	xperie	nce da	ata
Elevation where equipment receives Seismic Demand Spectrum (SDS) be In-structure respons Other in-structure rescale factor) Design basis earthq Other Scale Factor (SF)	s seismic input ased on: se spectrum (IRS) per DOE-STD-10 esponse spectrum (determine appro quake (DBE) per DOE-STD-1020	opriate e	xperie	nce da	ata
Elevation where equipment receives Seismic Demand Spectrum (SDS) be In-structure respons Other in-structure rescale factor) Design basis earthq Other Scale Factor (SF) Scale Factor (SF)	s seismic input ased on: se spectrum (IRS) per DOE-STD-10 esponse spectrum (determine appro juake (DBE) per DOE-STD-1020 Experience Data Factor (F	opriate e			ata
Elevation where equipment receives Seismic Demand Spectrum (SDS) by In-structure respons Other in-structure rescale factor) Design basis earthq Other Scale Factor (SF) Scale Factor (SF) Seference:	s seismic input ased on: se spectrum (IRS) per DOE-STD-10 esponse spectrum (determine appro juake (DBE) per DOE-STD-1020 Experience Data Factor (F	opriate e			ata
Elevation where equipment receives Seismic Demand Spectrum (SDS) by In-structure respons Other in-structure rescale factor) Design basis earthq Other Scale Factor (SF) Scale Factor (SF) Design basis earthq Other Scale Factor (SF)	s seismic inputased on: se spectrum (IRS) per DOE-STD-10 esponse spectrum (determine appropulate (DBE) per DOE-STD-1020 Experience Data Factor (F	opriate e	N ntent v	U	
Elevation where equipment receives Seismic Demand Spectrum (SDS) be In-structure respons Other in-structure rescale factor) Design basis earthq Other Scale Factor (SF) Oes capacity exceed demand? eference: Eaveats (Section 8.1.5) Deference Spectrum (Identify with an all eeting the specific wording of the caveat recommends of the caveat recomme	s seismic inputased on: se spectrum (IRS) per DOE-STD-10 esponse spectrum (determine appropriate (DBE) per DOE-STD-1020 Experience Data Factor (Factor (F	FED)Y met by iconclusion	N ntent v	withou	t N/A
Elevation where equipment receives Seismic Demand Spectrum (SDS) be In-structure respons Other in-structure rescale factor) Design basis earthq Other Scale Factor (SF) Oes capacity exceed demand? eference: Eaveats (Section 8.1.5) Reference Spectrum (Identify with an alleeting the specific wording of the caveat recommends of the caveat recommen	s seismic inputased on: se spectrum (IRS) per DOE-STD-10 esponse spectrum (determine appropriate (DBE) per DOE-STD-1020 Experience Data Factor (Factor (F	e met by i	ntent von in th	withour ne	t N/A
Elevation where equipment receives Seismic Demand Spectrum (SDS) by In-structure response Other in-structure response Scale factor) Design basis earthquarter of Other Scale Factor (SF) Oes capacity exceed demand? eference: Caveats (Section 8.1.5) Reference Spectrum (Identify with an	s seismic inputased on: se spectrum (IRS) per DOE-STD-10 esponse spectrum (determine appropriate (DBE) per DOE-STD-1020 Experience Data Factor (Factor	FED)Y met by iconclusion	N ntent v	withou	t N//
Elevation where equipment receives Seismic Demand Spectrum (SDS) basismic Demand Spectrum (SDS) basis in-structure responsed of the caveat recommend o	s seismic inputased on: se spectrum (IRS) per DOE-STD-10 esponse spectrum (determine appropriate (DBE) per DOE-STD-1020 Experience Data Factor (Factor	e met by i	ntent von in th	withour ne	t N//

SEWS 8.1.5 (2 of 4)

SCREENING EVALUATION WORK SHEET (SEW	'S) (Co	nt.)		
Equipment ID No.: Equipment Class: D	istribut	ion Pa	ınels	
Equipment description:				
Caveats (Cont.)				
6. Have you looked for and found no other adverse concerns?	Υ	N	U	N/A
Is the intent of all the caveats met for Reference Spectrum?	Y	N	U	N/A
GERS (Identify with an asterisk (*) those caveats which are met by intent with wording of the caveat rule and explain the reason for this conclusion in the COM	out mee	ting the	e spec on bel	ific ow)
Equipment is included in generic seismic testing equipment class	Υ	N	U	N/A
2. Meets all Reference Spectrum caveats	Ý	N	ŭ	N/A
3. If Switchboard GERS used, item is freestanding and designated as		• •		
a switchboard by the manufacturer	Υ	N	U	N/A
4. No Westinghouse Quicklag Type E Breakers	Y	N	U	N/A
5. Adjacent cabinets which are close enough to impact are				
bolted together	Y	N	U	N/A
Is the intent of all the caveats met for GERS?	Y	N	U	N/A
Anchorage (Chapter 6)				
1. Type of anchorage:				
expansion anchor				
cast-in-place bolt or headed stud anchor				
cast-in-place J-bolt				
grouted-in-place bolt				
welds to embedded steel on exposed steel				
lead cinch anchors				
☐ Other				
N/A (no further anchorage considerations)		• ''		
Appropriate characteristics for anchorage type checked				
(size, location, equipment characteristics)	Y	N	U	
3. Gap at threaded anchor less than 1/4 inch	Y	N	U	N/A
4. Base stiffness and no significant prying action requirements met	Υ	Ν	U	
Equipment base strength and structural load path adequate	Υ	N	U	
6. Embedment steel and pads requirements met	Υ	Ν	U	N/A
Embedment length requirements met	Υ	Ν	U	
Anchor spacing requirements met	Υ	Ν	U	
Edge distance requirements met	Υ	Ν	U	
10. Concrete strength requirements met	Y	N	U	

SEWS 8.1.5 (3 of 4)

Anchora 11. Co 12. Eq 13. Ins 14. No Does anchor	description: ge (Cont.) ncrete crack requirements met uipment with essential relays requirements met tallation adequacy requirements met other concerns orage capacity exceed demand?	Y Y	N N N N	U U U	N/A N/A
11. Co 12. Eq 13. Ins 14. No Does anche	ncrete crack requirements met uipment with essential relays requirements met tallation adequacy requirements met other concerns orage capacity exceed demand?	Y Y Y	N N N	U U	
11. Co 12. Eq 13. Ins 14. No Does anche	ncrete crack requirements met uipment with essential relays requirements met tallation adequacy requirements met other concerns orage capacity exceed demand?	Y Y Y	N N N	U U	
13. Ins 14. No Does anche Reference:	tallation adequacy requirements met other concerns orage capacity exceed demand?	Y	N N	U	
14. No Does anche Reference:	other concerns orage capacity exceed demand?	Y	N	U	N/A
Does ancho	orage capacity exceed demand?				
Reference:		Y	N		
				U	
Interaction	on Effects (Chapter 7)				
	ft targets free from impact by nearby equipment				
_	r structures	Y	N	U	N/A
	equipment contains sensitive essential relays, equipment free	Υ	K I		N/A
	rom all impact by nearby equipment or structures stribution lines have adequate flexibility	Y	N N	U	N/A
	collapse of overhead equipment, distribution systems,	,	14	U	13/7
	or masonry walls	Y	N		N/A
	uipment is free from credible and significant				
S	eismic-induced flood and spray concerns	Y	Ν		N/A
	credible seismic-induced fire concerns	Υ	N		N/A
	other "two over one" concerns as defined in DOE-STD-1021		N		N/A
8. N o	other concerns	Y	N	U	N/A
Is equipme	nt free of interaction effects?	Y	N	U	
Commer	ils				

SEWS 8.1.5 (4 of 4)

24	eet	A	٥f	
SΠ	ıeet	4	OT.	

			, , , , , , , , , , , , , , , , , , ,
Equip	oment ID No.:		Equipment Class: Distribution Panels
	ment descriptio		
Con	i ments (Cont.)		開業業 國有董事 新手工作 以上,在中国共享的主义是不是的基本的企业的工作,但是一个人们的主义之人的主义。 1
Scree	ening Walkdown	(s):	
	<u>Date</u>	<u>Time</u>	Team Members
Rec	ommend Re	solution	
Rec	ommend Re		
		action:	
	Maintenance Further evalu	action:	
	Maintenance Further evalu	action:	
0 0 0	Maintenance Further evalu Retrofit desig	action: uation: gn:	
	Maintenance Further evalu Retrofit desig	action: uation: gn:	. Equipment is seismically adequate.
0000	Maintenance Further evalue Retrofit design Other: No further ac	e action: uation: gn: ction required.	. Equipment is seismically adequate. smic adequacy have been addressed.
O All as	Maintenance Further evalue Retrofit design Other: No further ac	e action: uation: gn: ction required. uipment's seis	
All as	Maintenance Further evalu Retrofit desig Other: No further accepted the equipment of the eq	e action: uation: gn: ction required. uipment's seis	smic adequacy have been addressed.
All as	Maintenance Further evalue Retrofit design Other: No further accepted of the equation by:	e action: uation: gn: ction required. uipment's seis	smic adequacy have been addressed. Date:

SEWS 8.1.6 (1 of 4)

SCREENING EVALUATIO	N WORK SHEET (SI	EWS)		7	
Equipment ID No.:	Equipment Class: Tra	ansform	ners		
Equipment description:					
Equipment Location: Bldg.	Floor El.	Ro	om, R	ow/Co	1
Manufacturer, model, etc.:					
Weight:					
Drawing No.:	Performance Category	/ :			
Type (air cooled, oil cooled):	Voltage:				
Wall mounted:	Floor mounted:				
Functionality Requirement					
 Contact Lead Relay Reviewer to determine if iter For components whose function or structural inter For all other components, only anchorage evaluation 	grity is required, complete		ctions	of this	form.
Seismic Capacity vs. Demand					
Reference Spectrum GERS Existing documentation Elevation where equipment receives seismic ir Seismic Demand Spectrum (SDS) based on: In-structure response spectrur Other in-structure response spectrur scale factor) Design basis earthquake (DBE) Other	m (IRS) per DOE-STD-102 pectrum (determine appro E) per DOE-STD-1020		xperie	nce da	ıta
Scale Factor (SF) E	xperience Data Factor (F	_{ED})			
Does capacity exceed demand?		Υ	Ν	U	
Reference:					
Caveats (Section 8.1.6) Reference Spectrum (Identify with an asterisk (*)	those caveats which are r	net by i	ntent v	withou	t
meeting the specific wording of the caveat rule and ex COMMENTS section below)		onclusio	n in th	ie	
1. Equipment is included in earthquake experience	e equipment class	Y	N N	U	N/A N/A
3. For floor-mounted dry- and oil-type unit, transfo	rmer coils	-			
are positively restrained within cabinet 4. For 750 kVA or larger units, coils are top brace	d or adequately	Y	N	U	N/A
shown by evaluation 5. For 750 kVA or larger units, 2-inch clearance is		Y	N	U	N/A
between energized component and cabinet		Y	N	U	N/A
6. For 750 kVA or larger units, the slack in the cor the high-voltage leads and the first anchor ac	nection between commodates 3-inch				
relative displacement		Y	N	U	N/A

SEWS 8.1.6 (2 of 4)

Fauinment ID No · I Fau	ipment Class: Trans	form	ers		
	ipinient viass. Halls	.01111	313		
Equipment description:		a de la composición dela composición de la composición dela composición de la compos			
Caveats (Cont.)					
 For wall-mounted units, transformer coils anchored to e near enclosure support surface 	nclosure	Y	N	U	N/A
8. For floor-mounted units, anchorage does not rely on we		•	14	J	INA
bending of cabinet structures under lateral forces	,	Y	Ν	U	N/A
9. Adjacent cabinets which are close enough to impact are					
together if they contain essential relays		Y Y	N N	U	N/A N/A
 All doors secured by latch or fastener Have you looked for and found no other adverse conce 		τ Υ	N	Ü	N/A
•		Y	N	U	N/A
s the intent of all the caveats met for Reference Spectrum?		Υ	N	<u> </u>	N/A
GERS (Identify with an asterisk (*) those caveats which are n	net by intent without n	neetii	ng the	spec	ific
vording of the caveat rule and explain the reason for this cond					
Equipment is included in generic seismic testing equip	-	Y	N	U	N/A
Meets all Reference Spectrum caveats		Y	N	U	N/A
B. Dry-type unit (not oil-filled)		Y	N	U	N/A
Wall- or floor-mounted NEMA-type enclosure		Y Y	N	U	N/A
5. 120 to 480 VAC rating		Y Y	N	U	N/A
5. 7.5 to 225 kVA rating		Y Y	N N	U	N/A N/A
7. 180 to 2,000 pounds weight		Y Y	N N	U	N/A N/A
 Internal supports provide positive attachment of transf There is a sufficient clearance of 3/8 inches between I 		•	IN	U	IN/A
and enclosure		Υ	Ν	U	N/A
10. Adjacent cabinets which are close enough to impact ar		Υ	N	Ü	N/A
s the intent of all the caveats met for GERS?		Y	N	U	N/A
Anchorage (Chapter 6)				B 4 8 5 1 1 5	
1 Type of anchorage:					
,,					
expansion anchor	hor				
expansion anchorcast-in-place bolt or headed stud anc	hor				
expansion anchorcast-in-place bolt or headed stud anccast-in-place J-bolt	hor				
 expansion anchor cast-in-place bolt or headed stud anc cast-in-place J-bolt grouted-in-place bolt 					
expansion anchor cast-in-place bolt or headed stud anc cast-in-place J-bolt grouted-in-place bolt welds to embedded steel on exposed					
expansion anchor cast-in-place bolt or headed stud anc cast-in-place J-bolt grouted-in-place bolt welds to embedded steel on exposed lead cinch anchors					
expansion anchor cast-in-place bolt or headed stud anc cast-in-place J-bolt grouted-in-place bolt welds to embedded steel on exposed lead cinch anchors Other	steel				
expansion anchor cast-in-place bolt or headed stud anc cast-in-place J-bolt grouted-in-place bolt welds to embedded steel on exposed lead cinch anchors	steel				
expansion anchor cast-in-place bolt or headed stud anc cast-in-place J-bolt grouted-in-place bolt welds to embedded steel on exposed lead cinch anchors Other N/A (no further anchorage considerate	steel ions)				
expansion anchor cast-in-place bolt or headed stud anc cast-in-place J-bolt grouted-in-place bolt welds to embedded steel on exposed lead cinch anchors Other N/A (no further anchorage considerat	steel ions)	Υ	N	 U	
expansion anchor cast-in-place bolt or headed stud anc cast-in-place J-bolt grouted-in-place bolt welds to embedded steel on exposed lead cinch anchors Other N/A (no further anchorage considerat Appropriate characteristics for anchorage type checker (size, location, equipment characteristics)	steel ions)	Y Y	N N	 U U	N/A
expansion anchor cast-in-place bolt or headed stud and cast-in-place J-bolt grouted-in-place bolt welds to embedded steel on exposed lead cinch anchors Other N/A (no further anchorage considerat Appropriate characteristics for anchorage type checker (size, location, equipment characteristics) Gap at threaded anchor less than 1/4 inch	ions)				N/A
expansion anchor cast-in-place bolt or headed stud anc cast-in-place J-bolt grouted-in-place bolt welds to embedded steel on exposed lead cinch anchors Other N/A (no further anchorage considerat Appropriate characteristics for anchorage type checker (size, location, equipment characteristics) Appropriate characteristics for anchorage type checker (size, location, equipment characteristics) Gap at threaded anchor less than 1/4 inch Base stiffness and no significant prying action require	ions) ed ments met	Y	N	U	N/A
expansion anchor cast-in-place bolt or headed stud anc cast-in-place J-bolt grouted-in-place bolt welds to embedded steel on exposed lead cinch anchors Other N/A (no further anchorage considerate Appropriate characteristics for anchorage type checker (size, location, equipment characteristics) Appropriate characteristics for anchorage type checker (size, location, equipment characteristics) Gap at threaded anchor less than 1/4 inch Base stiffness and no significant prying action requires Equipment base strength and structural load path ade	ions) ed ments met	Y Y	N N	UUUU	N/A N/A
expansion anchor cast-in-place bolt or headed stud and cast-in-place J-bolt grouted-in-place bolt welds to embedded steel on exposed lead cinch anchors Other N/A (no further anchorage considerate Appropriate characteristics for anchorage type checker (size, location, equipment characteristics) Gap at threaded anchor less than 1/4 inch Base stiffness and no significant prying action require Equipment base strength and structural load path added Embedment steel and pads requirements met	ions) ed ments met	Y Y Y	N N N	UUUU	
expansion anchor cast-in-place bolt or headed stud and cast-in-place J-bolt grouted-in-place bolt welds to embedded steel on exposed lead cinch anchors Other N/A (no further anchorage considerated size, location, equipment characteristics) Appropriate characteristics for anchorage type checked (size, location, equipment characteristics) Gap at threaded anchor less than 1/4 inch Base stiffness and no significant prying action required significant prying action required significant significant prying action required significant significant significant prying action required significant signifi	ions) ed ments met	Y Y Y Y	N N N	U U U U	
expansion anchor cast-in-place bolt or headed stud and cast-in-place J-bolt grouted-in-place bolt welds to embedded steel on exposed lead cinch anchors Other N/A (no further anchorage considerat Appropriate characteristics for anchorage type checker (size, location, equipment characteristics) Gap at threaded anchor less than 1/4 inch Base stiffness and no significant prying action require Equipment base strength and structural load path add Embedment steel and pads requirements met Embedment length requirements met	ions) ed ments met	Y Y Y Y	N N N N	UUUU	

SEWS 8.1.6 (3 of 4)

	oment ID No.: Equ	ipment Class: Transfor	mers		
Equip	ment description:				
4nc	horage (Cont.)				
11.	Concrete crack requirements met	Υ	N	U	
2.	Equipment with essential relays requirements met	Υ	N	U	N/A
3.	Installation adequacy requirements met	Υ	N	U	N/A
4.	No other concerns	Υ	N	U	
oes	anchorage capacity exceed demand?	Y	N	U	
lefer	ence:				
nte	action Effects (Chapter 7)				
	Soft targets free from impact by nearby equipment				
	or structures	Y	N	U	N/A
2.	If equipment contains sensitive essential relays, equip from all impact by nearby equipment or structures	oment tree Y	N	U	N/A
3.	Attached lines have adequate flexibility	Y	N	U	N/A
,. }.	No collapse of overhead equipment, distribution syste	•	14	Ü	17/7
•	or masonry walls	Υ	N	U	N/A
.	Equipment is free from credible and significant			_	
	seismic-induced flood and spray concerns	Υ	Ν	U	N/A
) .	No credible seismic-induced fire concerns	Υ	N		N/A
' .	No other "two over one" concerns as defined in DOE-		N		N/A
l.	No other concerns	Y	N	U	N/A
s eq	uipment free of interaction effects?	Y	N	U	
<u>;on</u>	nments				
				,	
				,	

SEWS 8.1.6 (4 of 4)

Equi	pment ID No.:			Equipment Class: Trans	sformers
Equip	oment description	:	Turk mig. 19 gail Shows seems a visiting a	Company of the Market Company of the American Company of the Compa	
Con	nments (Cont.)				
Scree	ening Walkdown(s	s):			
	Date	<u>Time</u>	Team Members	ž	
Rec	ommend Res	olution			
Rec	commend Res Maintenance a				
		action:			
<u> </u>	Maintenance a	action:			
	Maintenance a	action:			
0 0 0	Maintenance a Further evalua Retrofit design Other:	action: ation: n:			
	Maintenance a Further evalua Retrofit design Other: No further act	action:ation:		cally adequate.	
C C C C C C C C C C C C C C C C C C C	Maintenance a Further evalua Retrofit design Other: No further act	action: ation: n: ion required. ipment's seis	Equipment is seismi	cally adequate.	Date:
All as	Maintenance a Further evalua Retrofit design Other: No further actions spects of the equi	action: ation: in: ion required.	Equipment is seismi mic adequacy have b	cally adequate. been addressed.	Date:
All as	Maintenance a Further evalua Retrofit design Other: No further action spects of the equivation by:	action: ation: in: ion required.	Equipment is seismi mic adequacy have b	cally adequate. been addressed.	Date:

SEWS 8.1.7 (1 of 4)

SCREENING EVALUATION	WORK SHEET (SEV	VS)			
Equipment ID No.:	Equipment Class: Battand	tery Cl		rs	
Equipment description:	-				
Equipment Location: Bldg.	Floor El.	Roo	m, Ro	ow/Co	l
Manufacturer, model, etc.:					
Voltage Input:	Output				
Current:	Weight (approximate):				
Actuator type:	_		<u></u>		
Drawing No.:	Performance Category:				
Functionality Requirement			35155		
 Contact Lead Relay Reviewer to determine if item For components whose function or structural integ For all other components, only anchorage evaluat 	grity is required, complete a		ions c	of this	form.
Seismic Capacity vs. Demand (Chapter 5)					
1. Seismic Capacity based on: Reference Spectrum GERS Existing documentation 2. Elevation where equipment receives seismic inpose Seismic Demand Spectrum (SDS) based on: In-structure response spectrum Other in-structure response spectrum scale factor) Design basis earthquake (DBE)	ı (IRS) per DOE-STD-1020 ectrum (determine appropri		perier	nce da	.ta
Scale Factor (SF) Ex	perience Data Factor (F _{ED})				
Does capacity exceed demand?		Y	N	U	
Reference:					
Caveats (Section 8.1.7)					
Reference Spectrum (Identify with an asterisk (*) the meeting the specific wording of the caveat rule and explicit COMMENTS section below)	hose caveats which are me lain the reason for this con	et by in	tent w	vithout e	
 Equipment is included in earthquake experience Solid state type For floor-mounted, transformer positively ancho 	ored and	Y	N N	U	N/A N/A
mounted near base, or load path is evaluated 4. Base-assembly of floor-mounted unit properly b stiffened for lateral forces	oraced or	Y Y	N N	U	N/A N/A
Stilleried for lateral forces		'	14	J	INA

SEWS 8.1.7 (2 of 4)

-dnit	oment ID No.:	uipment Class:	Battery and Inve		ers ——	
Equip	ment description:					Topic nation
Cave	eats (Cont.)					
j.	For wall-mounted units, transformer supports and brace	ing				<u> </u>
	provide adequate load path to the rear cabinet wall	-	Y	Ν	U	N/A
i.	All latches and fasteners in doors secured		Y	Ν	U	N/A
•	Adjacent cabinets which are close enough to impact a	re bolted				
,	together if they contain essential relays	arno?	Y	N	U	N/A
١.	Have you looked for and found no other adverse conce	G111 5	Υ	N	U	N/A
s the	intent of all the caveats met for Reference Spectrum?		Y	N	U	N/A
	RS (Identify with an asterisk (*) those caveats which are ng of the caveat rule and explain the reason for this con					
	Equipment is included in generic seismic testing equi		Υ	N	U	N/A
· ?.	Meets all Reference Spectrum caveats	pom olado	Ϋ́	N	U	N/A
 3.	Silicon-controlled Rectifier (SCR) power controls; wal	l- or	•	. •	•	14/74
	floor-mounted NEMA-type enclosure	- •	Υ	N	U	N/A
1 .	Within range of battery charger ratings:		•	••	•	. 4//1
•	24-250 VDC		Υ	Ν	U	N/A
	120-480 VAC		Ý	N	Ü	N/A
	25-600 amps		Ý	N	Ü	N/A
	150-2,850 pounds (floor mounted)		Ý	N	Ü	N/A
	150-600 pounds (wall mounted)		Ý	N	Ŭ	N/A
5 .	Within range of inverter ratings:		•	-	-	• •
-	120 VDC only		Υ	N	U	N/A
	120-480 VAC		Ý	N	Ŭ	N/A
	0.5-15 kVA		Ý	N	Ū	N/A
	300-2,000 pounds		Ý	N	Ū	N/A
ò.	Heavy components are located in lower half of cabine	et and				
-	are supported from base or rear panel with no pane					
	adjacent to attachment		Y	N	U	N/A
,	Adjacent cabinets which are close enough to impact	are bolted togeth		N	Ū	N/A
	intent of all the caveats met for GERS?		Υ	N	U	N/A
o lile	, mont of an ino dayeate met for all to:			. 4	3	. 47
******	horage (Chapter 6)					
	Type of anchorage:					
	expansion anchor					
	cast-in-place bolt or headed stud and	chor			•	
	cast-in-place J-bolt					
	grouted-in-place bolt					
	welds to embedded steel on expose	d steel				
	lead cinch anchors					
	Other					
	<u> </u>					

SEWS 8.1.7 (3 of 4)

	pment ID No.: Equipment	Class:	Battery (ers	
Equip	oment description:				······································	
Anc	horage (Cont.)					
2.	Appropriate characteristics for anchorage type checked					
	(size, location, equipment characteristics)		Υ	Ν	U	
3.	Gap at threaded anchor less than 1/4 inch		Υ	Ν	U	N/A
4.	Base stiffness and no significant prying action requirements me	et	Υ	N	U	
5.	Equipment base strength and structural load path adequate		Υ	N	U	
6.	Embedment steel and pads requirements met		Υ	N	U	N/A
7.	Embedment length requirements met		Υ	N	U	
8.	Anchor spacing requirements met		Y	N	U	
9.	Edge distance requirements met		Y	N	U	
10.	Concrete strength requirements met		Y	N	U	
11.	Concrete crack requirements met		Y	N	U	
12.	Equipment with essential relays requirements met		Y	N	U	N/A
13.	Installation adequacy requirements met		Y	N	U	N/A
14.	No other concerns		Y	N	U	
	anchorage capacity exceed demand? rence:		Υ	N	U	
	raction Effects (Chapter 7)					
۱.	Soft targets free from impact by nearby equipment					
	or structures		Υ	Ν	U	N/A
2.	If equipment contains sensitive essential relays, equipment fre	е				
	from all impact by nearby equipment or structures		Y	N	U	N/A
3.	Attached lines have adequate flexibility		Υ	N	U	N/A
1 .	No collapse of overhead equipment, distribution systems,					
	or masonry walls		Y	N	U	N/A
5.	Equipment is free from credible and significant					81/4
	seismic-induced flood and spray concerns		Y	N	U	N/A
_	No credible seismic-induced fire concerns		Y	N		N/A
	No other "two over one" concerns as defined in DOE-STD-102	.1	Y	N		N/A
7.	No other concerns		Y	N	U	N/A
7.	110 0.1101 0.1100					
6. 7. 8. Is eq	uipment free of interaction effects?		Y	N	U	

SEWS 8.1.7 (4 of 4)

Equi	pment ID No.:			ORK SHEET (SE Equipment Class:	
Equi	pment description				
Cor	nments (Cont.)				
Scre	ening Walkdown(s	s):			
	<u>Date</u>	<u>Time</u>	Team Member	<u>s</u>	
Red	commend Res	olution			
	Maintenance a	action:			
	Further evalua	ation:			
	Retrofit design	ı:			
	Other:	-			·
	3. ALC 1881				
		ion required	Fauinment is seism	ically adequate	
۵	No further act		Equipment is seism		
□ All a	No further acti		Equipment is seism		
All a	No further acti spects of the equi	pment's seisr	nic adequacy have I	oeen addressed.	
All a	No further acti	pment's seisr	nic adequacy have I	oeen addressed.	
All a	No further acti spects of the equi	pment's seisr	nic adequacy have I	oeen addressed.	

SEWS 8.1.8 (1 of 4)

SCREENING EVALUATION	WORK SHEET (SE	WS)			
Equipment ID No.:	Equipment Class: Instr Cont	umen rol Pa		and	
Equipment description:	4.00				
System:	T	ı			
Equipment Location: Bldg.	Floor El.	Roc	m, Ro	ow/Co	<u>I.</u>
Weight of each Panel:					
Manufacturer, model, etc.:	<u> </u>				
Drawing No.:	Performance Category:				
Functionality Requirement					
 Contact Lead Relay Reviewer to determine if item For components whose function or structural integ For all other components, only anchorage evaluation 	rity is required, complete a		ions o	of this	form.
Seismic Capacity vs. Demand (Chapter 5)					
 Seismic Capacity based on: Reference Spectrum GERS Existing documentation Elevation where equipment receives seismic inp Seismic Demand Spectrum (SDS) based on:	(IRS) per DOE-STD-1020 ctrum (determine appropri per DOE-STD-1020		perier	nce da	ita
Scale Factor (SF) Ex	perience Data Factor (F _{ED})				
Does capacity exceed demand?		Y	N	U	
Reference:					
Caveats (Section 8.1.8)					
Reference Spectrum (Identify with an asterisk (*) the meeting the specific wording of the caveat rule and explicit COMMENTS section below)					;
 Equipment is included in earthquake experience No computers or programmable controllers Strip chart recorders evaluated Steel frame and sheet metal structurally adequate 		Y Y Y	N N N N	U U U	N/A N/A N/A N/A

SEWS 8.1.8 (2 of 4)

•	oment ID No.:	quipment Class: Instrur Contro	nentatio I Panels		
Equip	ment description:				
Cavo	eats (Cont.)				
5. 3. 7.	Adjacent cabinets or panels which are close enough or sections of multi-bay cabinets or panels, are be together if they contain essential relays Drawers and equipment on slides restrained from fa All doors secured by latch or fastener Have you looked for and found no other adverse co	olted Y Alling out Y Y	N N	U U U	N/A N/A N/A N/A
s the	intent of all the caveats met for Reference Spectrum?	Y	N	U	N/A
Anci	horage (Chapter 6)				
	expansion anchor cast-in-place bolt or headed stud a cast-in-place J-bolt grouted-in-place bolt welds to embedded steel on expos lead cinch anchors Other N/A (no further anchorage conside	ed steel			
2. 3. 4. 5.	Appropriate characteristics for anchorage type chec (size, location, equipment characteristics) Gap at threaded anchor less than 1/4 inch Base stiffness and no significant prying action requestion that the same characteristics is the same characteristics.	cked Yellow the second of the	N N	U U U	N/A
6. 7. 8. 9.	Embedment steel and pads requirements met Embedment length requirements met Anchor spacing requirements met Edge distance requirements met Concrete strength requirements met)))	'N 'N	U U U U	N/A
11. 12. 13.	Concrete crack requirements met Equipment with essential relays requirements met Installation adequacy requirements met No other concerns		N N N N	UUU	N/A N/A

SEWS 8.1.8 (3 of 4)

Sheet 3 of

or structures If equipment contains sensitive essential relays, equipment free from all impact by nearby equipment or structures Y N U N/A Attached lines have adequate flexibility Y N U N/A No collapse of overhead equipment, distribution systems, or masonry walls Y N U N/A Equipment is free from credible and significant seismic-induced flood and spray concerns Y N U N/A No credible seismic-induced fire concerns Y N N/A No other "two over one" concerns as defined in DOE-STD-1021 Y N N/A	qui	pment ID No.: Equipment Class	s: Instrume Control P			
Soft targets free from impact by nearby equipment or structures Y N U N/A If equipment contains sensitive essential relays, equipment free from all impact by nearby equipment or structures Y N U N/A Attached lines have adequate flexibility Y N U N/A No collapse of overhead equipment, distribution systems, or masonry walls Equipment is free from credible and significant seismic-induced flood and spray concerns Y N U N/A No credible seismic-induced fire concerns Y N N/A No other "two over one" concerns as defined in DOE-STD-1021 Y N N/A No other concerns Y N U N/A equipment free of interaction effects? Y N U	<u> </u>	oment description:				
or structures If equipment contains sensitive essential relays, equipment free from all impact by nearby equipment or structures Attached lines have adequate flexibility No collapse of overhead equipment, distribution systems, or masonry walls Equipment is free from credible and significant seismic-induced flood and spray concerns No credible seismic-induced fire concerns Y N U N/A No other "two over one" concerns as defined in DOE-STD-1021 Y N U N/A No other concerns Y N U N/A No other concerns Y N U N/A No other concerns Y N U N/A No other one of interaction effects? Y N U N/A Pomments	nte	raction Effects (Chapter 7)				
If equipment contains sensitive essential relays, equipment free from all impact by nearby equipment or structures YN NU N/A Attached lines have adequate flexibility YN UN/A No collapse of overhead equipment, distribution systems, or masonry walls YN UN/A Equipment is free from credible and significant seismic-induced flood and spray concerns YN UN/A No credible seismic-induced fire concerns YN NU N/A No other "two over one" concerns as defined in DOE-STD-1021 YN NU/A No other concerns YN UN/A equipment free of interaction effects? YN UN/A Comments						
from all impact by nearby equipment or structures Y N U N/A Attached lines have adequate flexibility Y N U N/A No collapse of overhead equipment, distribution systems, or masonry walls Y N U N/A Equipment is free from credible and significant seismic-induced flood and spray concerns Y N U N/A No credible seismic-induced fire concerns Y N N/A No other "two over one" concerns as defined in DOE-STD-1021 Y N N/A No other concerns Y N U N/A equipment free of interaction effects? Y N U) 	· · · · · · · · · · · · · · · · · · ·	Y	N	U	N/A
Attached lines have adequate flexibility No collapse of overhead equipment, distribution systems, or masonry walls Equipment is free from credible and significant seismic-induced flood and spray concerns No credible seismic-induced fire concerns No other "two over one" concerns as defined in DOE-STD-1021 No other concerns Y N U N/A No other concerns Y N U N/A No other concerns Y N U N/A No other concerns Y N U N/A No other concerns Y N U N/A requipment free of interaction effects? Y N U	•		Υ	N	U	N/A
or masonry walls Equipment is free from credible and significant seismic-induced flood and spray concerns No credible seismic-induced fire concerns No other "two over one" concerns as defined in DOE-STD-1021 No other concerns Y N N/A No other concerns Y N U N/A equipment free of interaction effects? Y N U omments	.					N/A
Equipment is free from credible and significant seismic-induced flood and spray concerns YN N UN/A No credible seismic-induced fire concerns YN N N/A No other "two over one" concerns as defined in DOE-STD-1021 YN N/A No other concerns YN N UN/A equipment free of interaction effects? YN UN/A comments	•					
seismic-induced flood and spray concerns No credible seismic-induced fire concerns No other "two over one" concerns as defined in DOE-STD-1021 No other concerns Y N N/A No other concerns Y N U N/A Requipment free of interaction effects? Y N U			Υ	N	U	N/A
No credible seismic-induced fire concerns No other "two over one" concerns as defined in DOE-STD-1021 No other concerns Y N N/A No other concerns Y N U N/A equipment free of interaction effects? Y N U omments			V	N	Н	N/A
No other "two over one" concerns as defined in DOE-STD-1021 Y N N/A No other concerns Y N U N/A equipment free of interaction effects? Y N U Omments	i .				J	N/A
equipment free of interaction effects? YNU omments	•	No other "two over one" concerns as defined in DOE-STD-1021	Υ	Ν		N/A
		No other concerns	Υ	Ν	U	N/A
	eq	uipment free of interaction effects?	Υ	Ν	U	

SEWS 8.1.8 (4 of 4)

	ent ID No.:		Equipment Class: Instrumen Control Pa	tation and inels
Equipme	ent description:			
Comm	ents (Cont.)			
Screenir	ng Walkdown(s):			
1	Date Time	Team Members		
	nmend Resolution			
)	Maintenance action:			
	Maintenance action:			
	Maintenance action: Further evaluation: Retrofit design:			
	Maintenance action: Further evaluation: Retrofit design: Other:			
	Maintenance action: Further evaluation: Retrofit design: Other: No further action required.			
	Maintenance action: Further evaluation: Retrofit design: Other:			
All aspe	Maintenance action: Further evaluation: Retrofit design: Other: No further action required. cts of the equipment's seis	mic adequacy have b	een addressed.	Date:
All aspe	Maintenance action: Further evaluation: Retrofit design: Other: No further action required. cts of the equipment's seistion by:	mic adequacy have b	een addressed.	Date:

SEWS 8.1.9 (1 of 4)

	\$	CREENING	EVALUATION	ON WORK SHEE	T (SEWS)		
Equipment I	D No.:			Equipment Clas	s: Instrum	ents o	n Rac	ks
Equipment d	escription:							
Equipment L	ocation:	Bldg.		Floor El.		Room, F	Row/C	ol.
Manufacture	r. model. et	tc.:						
Weight:	·/							
				Dod-				
Drawing No.: Functiona				Performance Cat	egory:			
For col	mponents v	whose function conents, only a	or structural int	em contains Essential egrity is required, con ation is required.		ections	of this	form.
1. Seisi	mic Capaci	nd Spectrum (S In-structure re Other in-struct scale factor) Design basis e	ectrum mentation ceives seismic i DS) based on: sponse spectru ture response s	nput m (IRS) per DOE-STI pectrum (determine a E) per DOE-STD-102	D-1020 ppropriate		ence d	ata
	Scale F	actor (SF)		Experience Data Facto	or (F _{ED})			
Does capacit	y exceed d	lemand?			Υ	N	U	
Reference:								
Caveats (s	Spectrum specific wo	n (Identify with rding of the cav		those caveats which plain the reason for th				t
1. Equi	pment is in	cluded in earth	•	ce equipment class	Υ	N	υ	N/A
		or programmab			Y	N	U	N/A
4. Adja	cent racks	which are close	tructurally adeq e enough to imp d together if the	act, or sections	Y	N	U	N/A
	sential relay	•		, - 	Υ	N	U	N/A
5. Have	you looke	d for and found	d no other adve	rse concerns?	Υ	Ν	U	N/A
Is the intent of	of all the ca	veats met for F	Reference Spec	trum?	Y	N	U	N/A

SEWS 8.1.9 (2 of 4)

Equip	pment ID No.: Equipment Class: In	strume	nts or	Rack	S
<u>Equip</u>	ment description:		3.000		
Javi	eats (Cont.)				
GEF	RS (Identify with an asterisk (*) those caveats which are met by intent with	out meet	ing th	e spec	ific
	ng of the caveat rule and explain the reason for this conclusion in the COM				
ļ.	Equipment is included in generic seismic testing equipment class	Y	N	U	N/A
2.	Meets all Reference Spectrum caveats	Y	N	U	N/A
3.	Component is a pressure, temperature, level or flow transmitter	Y	N	U	N/A
4.	Component is one of the specific makes and models tested	Υ	N	U	N/A
5.	Necessary function of component not sensitive to seismically	.,			51/4
_	induced system perturbations (e.g., sloshing)	Y	N	U	N/A
3 .	No vacuum tubes	Y	N	U	N/A
7.	All external mounting bolts in place	Υ	N	U	N/A
3.	Demand based on amplified portion of 3% damped floor response	.,			5 1/4
_	spectrum if estimated natural frequency of rack less than 33 Hertz	Y	N	U	N/A
9.	Rack capable of structurally transferring GERS level seismic				B 1 / A
	loads to anchorage	Y	N	U	N/A
10.	Adjacent racks which are close enough to impact, or sections of				B 1 / A
	multi-bay racks, are bolted together	Υ	Ν	U	N/A
- ••	intend of all the accounts mat for OFROS	V	K1	1.1	KI/A
ls the	intent of all the caveats met for GERS?	Y	N	U	N/A
ls the	intent of all the caveats met for GERS?	Y	N	U	N/A
	intent of all the caveats met for GERS? horage (Chapter 6)	Y	N	U	N/A
Anc	horage (Chapter 6)	Y	N	U	N/A
Anc		Y	N	U	N/A
Anc	horage (Chapter 6) Type of anchorage: acceptance and anchor	Y	N	U	N/A
Anc	horage (Chapter 6) Type of anchorage: expansion anchor cast-in-place bolt or headed stud anchor	Y	N	U	N/A
Anc	horage (Chapter 6) Type of anchorage: expansion anchor cast-in-place bolt or headed stud anchor cast-in-place J-bolt	Y	N	U	N/A
Anc	horage (Chapter 6) Type of anchorage: expansion anchor cast-in-place bolt or headed stud anchor cast-in-place J-bolt grouted-in-place bolt	Y	N	U	N/A
Anc	horage (Chapter 6) Type of anchorage:	Y	N	U	N/A
Anc	horage (Chapter 6) Type of anchorage: expansion anchor cast-in-place bolt or headed stud anchor cast-in-place J-bolt grouted-in-place bolt welds to embedded steel on exposed steel lead cinch anchors	Y	N	U	N/A
Anc	horage (Chapter 6) Type of anchorage:	Y	N	U	N/A
Anc	horage (Chapter 6) Type of anchorage: expansion anchor cast-in-place bolt or headed stud anchor cast-in-place J-bolt grouted-in-place bolt welds to embedded steel on exposed steel lead cinch anchors	Y	N	U	N/A
Anc 1.	horage (Chapter 6) Type of anchorage:	Y	N	U	N/A
Anc	Type of anchorage:	Y	N N	U	N/A
Anc 1.	Type of anchorage: expansion anchor cast-in-place bolt or headed stud anchor cast-in-place J-bolt grouted-in-place bolt welds to embedded steel on exposed steel lead cinch anchors Other N/A (no further anchorage considerations) Appropriate characteristics for anchorage type checked (size, location, equipment characteristics)		N	U	
2. 3.	Type of anchorage: expansion anchor cast-in-place bolt or headed stud anchor grouted-in-place bolt welds to embedded steel on exposed steel lead cinch anchors N/A (no further anchorage considerations) Appropriate characteristics for anchorage type checked (size, location, equipment characteristics) Gap at threaded anchor less than 1/4 inch	Y	N N	U	
2. 3. 4.	Type of anchorage: expansion anchor cast-in-place bolt or headed stud anchor cast-in-place J-bolt grouted-in-place bolt welds to embedded steel on exposed steel lead cinch anchors Other N/A (no further anchorage considerations) Appropriate characteristics for anchorage type checked (size, location, equipment characteristics) Gap at threaded anchor less than 1/4 inch Base stiffness and no significant prying action requirements met	Y	N N N	UUUUU	
2. 3. 4. 5.	horage (Chapter 6) Type of anchorage:	Y	N N N N	UUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUU	N/A
2. 3. 4. 5. 6.	Type of anchorage: expansion anchor cast-in-place bolt or headed stud anchor grouted-in-place bolt welds to embedded steel on exposed steel lead cinch anchors Other	YYYYY	N N N N N	U U U U U	N/A
2. 3. 4. 5. 6. 7.	Type of anchorage: expansion anchor	Y Y Y Y Y	N N N N N N	U U U U U	N/A
2. 3. 4. 5. 6.	Type of anchorage: expansion anchor cast-in-place bolt or headed stud anchor grouted-in-place bolt welds to embedded steel on exposed steel lead cinch anchors Other	YYYYY	N N N N N	U U U U U	N/A

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Anchorage (cont.) Anchorage (cont.) 12. Equipment with essential relays requirements met 13. Installation adequacy requirements met 14. No other concerns 15. Provided in the second demand? 16. Soft targets free from impact by nearby equipment or structures 17. If equipment contains sensitive essential relays, equipment free from all impact by nearby equipment or structures 18. Attached lines have adequate flexibility 19. No collapse of overhead equipment, distribution systems, or masonry walls 19. Equipment is free from credible and significant seismic-induced flood and spray concerns 19. No credible seismic-induced fire concerns 19. No other "two over one" concerns as defined in DOE-STD-1021 20. Sequipment free of interaction effects?	nchorage (Cont.)		<u>ume</u>	nts or	Rack	(S
11. Concrete crack requirements met 12. Equipment with essential relays requirements met 13. Installation adequacy requirements met 14. No other concerns 15. Volument with essential relays requirements met 16. No other concerns 17. No other concerns 18. Soft targets free from impact by nearby equipment 19. or structures 19. If equipment contains sensitive essential relays, equipment free 19. If equipment contains sensitive essential relays, equipment free 19. Attached lines have adequate flexibility 19. No collapse of overhead equipment, distribution systems, 19. or masonry walls 19. Equipment is free from credible and significant 19. Sequipment is free from credible and s						
12. Equipment with essential relays requirements met 13. Installation adequacy requirements met 14. No other concerns 15. No other concerns 16. Soft targets free from impact by nearby equipment 17. or structures 18. Attached lines have adequate flexibility 19. No collapse of overhead equipment, distribution systems, 19. or masonry walls 19. Equipment is free from credible and significant 19. Segment is free from credible seismic-induced fire concerns 19. No other "two over one" concerns as defined in DOE-STD-1021 19. No other "two over one" concerns as defined in DOE-STD-1021 19. No other "two over one" concerns as defined in DOE-STD-1021 19. No other "two over one" concerns as defined in DOE-STD-1021 20. No other "two over one" concerns as defined in DOE-STD-1021 21. No other "two over one" concerns as defined in DOE-STD-1021 22. No other "two over one" concerns as defined in DOE-STD-1021 23. No other concerns						
Does anchorage capacity exceed demand? Reference: Interaction Effects (Chapter 7) 1. Soft targets free from impact by nearby equipment or structures 2. If equipment contains sensitive essential relays, equipment free from all impact by nearby equipment or structures 3. Attached lines have adequate flexibility 4. No collapse of overhead equipment, distribution systems, or masonry walls 5. Equipment is free from credible and significant seismic-induced flood and spray concerns 6. No credible seismic-induced fire concerns 7. No other "two over one" concerns as defined in DOE-STD-1021 7. No other concerns	Equipment with essential relays requirements met Installation adequacy requirements met	l	Y	Ν	U	N/A N/A
Interaction Effects (Chapter 7) Soft targets free from impact by nearby equipment or structures If equipment contains sensitive essential relays, equipment free from all impact by nearby equipment or structures Attached lines have adequate flexibility No collapse of overhead equipment, distribution systems, or masonry walls Equipment is free from credible and significant seismic-induced flood and spray concerns No credible seismic-induced fire concerns No other "two over one" concerns as defined in DOE-STD-1021 No other concerns						
Interaction Effects (Chapter 7) Soft targets free from impact by nearby equipment or structures If equipment contains sensitive essential relays, equipment free from all impact by nearby equipment or structures Attached lines have adequate flexibility No collapse of overhead equipment, distribution systems, or masonry walls Equipment is free from credible and significant seismic-induced flood and spray concerns No credible seismic-induced fire concerns No other "two over one" concerns as defined in DOE-STD-1021 No other concerns			Y	N	U	
Soft targets free from impact by nearby equipment or structures If equipment contains sensitive essential relays, equipment free from all impact by nearby equipment or structures Attached lines have adequate flexibility No collapse of overhead equipment, distribution systems, or masonry walls Equipment is free from credible and significant seismic-induced flood and spray concerns No credible seismic-induced fire concerns No other "two over one" concerns as defined in DOE-STD-1021 No other concerns						
or structures If equipment contains sensitive essential relays, equipment free from all impact by nearby equipment or structures Attached lines have adequate flexibility No collapse of overhead equipment, distribution systems, or masonry walls Equipment is free from credible and significant seismic-induced flood and spray concerns No credible seismic-induced fire concerns No other "two over one" concerns as defined in DOE-STD-1021 No other concerns		+				
from all impact by nearby equipment or structures Attached lines have adequate flexibility No collapse of overhead equipment, distribution systems, or masonry walls Equipment is free from credible and significant seismic-induced flood and spray concerns No credible seismic-induced fire concerns No other "two over one" concerns as defined in DOE-STD-1021 No other concerns	or structures		Y	N	U	N/A
No collapse of overhead equipment, distribution systems, or masonry walls Equipment is free from credible and significant seismic-induced flood and spray concerns No credible seismic-induced fire concerns No other "two over one" concerns as defined in DOE-STD-1021 No other concerns	from all impact by nearby equipment or structure	e dipriorit rice				N/A
or masonry walls Equipment is free from credible and significant seismic-induced flood and spray concerns No credible seismic-induced fire concerns No other "two over one" concerns as defined in DOE-STD-1021 No other concerns V N V N V N V N V N V N V N V N V N V N		vstems.	Υ	N	U	N/A
seismic-induced flood and spray concerns No credible seismic-induced fire concerns No other "two over one" concerns as defined in DOE-STD-1021 No other concerns Y N V N U	or masonry walls	, 5.55,	Υ	N		N/A
No credible seismic-induced fire concerns No other "two over one" concerns as defined in DOE-STD-1021 No other concerns Y N V N U			Υ	N		N/A
. No other concerns Y N U	No credible seismic-induced fire concerns		Υ	N		N/A
· ···		DE-STD-1021			ш	N/A N/A
			•		_	14/7
comments						
Chiments	ommente.					

SEWS 8.1.9 (4 of 4)

	SCR	EENING E	VALUATION W	ORK SHEET (SEWS) (Cont.)
Equip	ment ID No.:			Equipment Class: Instru	ments on Racks
Equipn	nent description:				
Comi	ments (Cont.)				
Screer	ning Walkdown(s	s):			
	<u>Date</u>	<u>Time</u>	Team Member	<u>s</u>	!
Reco	mmend Res	olution			
۵	Maintenance a	action:			
۵	Further evalua	ution:			
	Retrofit design	n:			
	Other:				
		ion required	Equipment is seism		
			mic adequacy have		
[ation by:				Date:
1	am members)				

SEWS 8.1.10 (1 of 3)

Ob4		- 2	
Sheet	1	OT	

	SCREENING EVALUAT	TON WORK SHEET (SI	EWS)		
Equipment ID No.:		Equipment Class: Te	mpera	ture S	ensor	's
Equipment description	1:					
System:						
Equipment Location: I	Bldg.	Floor El.	R	oom, F	low/Co	ol.
Manufacturer, model,	etc.:					
Approximate Weight:						
Drawing No.:		Performance Category			29.00.81	
Functionality Rec	uirement					
For components	elay Reviewer to determine if it whose function or structural ir nponents, only anchorage eval	ntegrity is required, complete		ctions	of this	form.
Seismic Capacity	vs. Demand (Chapter 5)					
Seismic Dema	Reference Spectrum GERS Existing documentation re equipment receives seismic and Spectrum (SDS) based on: In-structure response spectr Other in-structure response scale factor) Design basis earthquake (Di Other	: rum (IRS) per DOE-STD-102 spectrum (determine approp BE) per DOE-STD-1020	riate e	experie N	nce da	ata
Caveats (Section 8.1	.10)					
Reference Spectrumeeting the specific wo	im (Identify with an asterisk (* ording of the caveat rule and e pelow)	those caveats which are maxplain the reason for this cor	et by i	ntent v	vithout e	
No possibility of between more	ncluded in earthquake experie of detrimental differential displa unting of connection head and	acement	Y	N	U	N/A
temperature 3. Associated ele	sensor ectronics are all solid state (no	vacuum tubes)	Y Y	N N	U U	N/A N/A
	ed for and found no other adve		Y	N	Ū	N/A
Is the intent of all the c	aveats met for Reference Spe	ctrum?	Y	N	U	N/A

SEWS 8.1.10 (2 of 3)

	SC	REENING EVALUATION W	ORK SHEET (SEW	/S) (Cd	ont.)		
Equip	ment ID No.:		Equipment Class: To	emperat	ure S	ensor	s
Equipn	nent description	ղ։					
Anch	orage (Chapt	er 6)					
1.	Type of ancho						
	ū	expansion anchor					
		cast-in-place bolt or headed stud	anchor				
	Ö	cast-in-place J-bolt					
	<u></u>	grouted-in-place bolt					
		welds to embedded steel on exp	osed steel				
		lead cinch anchors					
		Other	·		_		
		N/A (no further anchorage consid	derations)				
2.		haracteristics for anchorage type ch	ecked				
_		on, equipment characteristics)		Y	N	U	NI/A
3.		ded anchor less than 1/4 inch		Y	N	Ŋ	N/A
4.		s and no significant prying action red		Y Y	N N	U	
5.		ase strength and structural load path	adequate	Ϋ́Υ	N	U	N/A
6. 7		steel and pads requirements met ength requirements met		Ý	N	Ü	IVA
7. 8.		ng requirements met		Ý	N	U	
9.		e requirements met		Ÿ	N	Ü	
10.		ength requirements met		Ý	N	Ŭ	
11.		ck requirements met		Ý	N	Ū	
12.		ith essential relays requirements me	et	Ý	N	Ū	N/A
13.		dequacy requirements met		Υ	Ν	U	N/A
14.	No other con-			Υ	N	U	
Does a	anchorage capa	acity exceed demand?		Υ	N	U	
Refere	ence:		···				
	action Effec						
1.	_	ree from impact by nearby equipme	nt	v	k i	1.1	N/A
	or structure		and in mont from	Y	N	U	N/A
2.		contains sensitive essential relays,	• •	Υ	N	U	N/A
3		pact by nearby equipment or structu s have adequate flexibility	103	Ϋ́	N	U	N/A
3. 4.		of overhead equipment, distribution	systems	ı	14	•	1 11/17
7.	or masonry		90.0110,	Y	N		N/A
5.		free from credible and significant		•	•	,	
٦.		luced flood and spray concerns		Υ	N		N/A
6.		eismic-induced fire concerns		Y	N		N/A
7.		o over one" concerns as defined in [OOE-STD-1021	Υ	Ν		N/A
8.	No other con			Υ	N	U	N/A
ls equ	ipment free of i	nteraction effects?		Y	N	U	
-,-	•						

SEWS 8.1.10 (3 of 3)

Sheet	3 of	

	S	CREENING	EVALUATION W	ORK SHEET (SEWS) (Co	nt.)
Equip	ment ID No.:			Equipment Class: Temperatu	ure Sensors
Equip	ment description	on:			
Com	ments				
Scree	ning Walkdowr	n(s):			
	<u>Date</u>	<u>Time</u>	Team Members		
					ļ
					:
					i
Rec	ommend Re	solution			
a	Maintenance	action:			
	Further evalu	uation:			
	Retrofit desig	gn:			
	Other:				
۵	No further ac	ction required.	Equipment is seismi	cally adequate.	
All as	pects of the eq	uipment's seis	mic adequacy have b	een addressed.	
Evalu	ation by:				Date:
(All te	am members)				
<u></u>					

opposed and the second and the secon		
:		
3		
¥		
1		
T. Control of the Con		

SEWS 8.2.1 (1 of 4)

Sheet	1 ^	£	
JUMPI		1	

Equipment ID No.:	Equipment Class:	Fluid-Op Air-Oper			
Equipment description:					
Equipment Location: Bldg.	Floor El.	R	oom, R	ow/Co	l
Manufacturer, model, etc.:		· · · · · · · · · · · · · · · · · · ·			
Smallest pipe diameter attached to valve:					
Pipe centerline to top of motor actuator length:					
/alve material:	Yoke material:		<u></u>		
Veight:			··· <u> </u>		
Drawing No.:	Performance Category	gory:			
Functionality Requirement					
Seismic Capacity vs. Demand (Chapter Seismic Capacity based on: Reference Spectrum GERS Existing documentation Elevation where equipment receives se Seismic Demand Spectrum (SDS) base	n eismic inputed on:	1000			
Other in-structure resp scale factor)	spectrum (IRS) per DOE-STD- onse spectrum (determine ap ke (DBE) per DOE-STD-1020	propriate	experie	nce da	ita
Scale Factor (SF)	Experience Data Factor	(F _{ED})			
Does capacity exceed demand?		Υ	N	U	
Reference:					
Caveats (Section 8.2.1)					
Reference Spectrum Fluid-Operated Valve intent without meeting the specific wording of the COMMENTS section below)					
1. Equipment is included in earthquake exp	perience equipment class	Y Y	N N	U	N/A N/A
 No cast-iron body No cast-iron yoke (for spring-operated p 	procedure relief or	1	14	0	IN/A

SEWS 8.2.1 (2 of 4)

Equipment ID No.: Equipment Class: Fluid-Operated/ Air-Operated Valves					
Equip	ment description:				
Cav	eats (Cont.)				
4. 5.	Mounted on 1-inch diameter pipe or larger Centerline of pipe to top of operator within restrictions or can take static 3g load (for air-operated diaphragm, lig piston-operated, and spring-operated pressure relief vi	htweight	N	U	N/A N/A
3.	Centerline of pipe to top of operator within restrictions or yoke can take static 3g load (for piston-operated valve of substantial weight)	Y	N	U	N/A
7.	Actuator and yoke not braced independently from pipe	Ϋ́	N	Ü	N/A
, . 3.	Have you looked for and found no other adverse concern		N	Ü	N/A
	intent of all the caveats met for Reference Spectrum?	Y	N	U	N/A
]. 2.	Equipment is included in generic seismic testing equipm Meets all Reference Spectrum caveats Air operated gate or globe valve with spring-opposed directions.	Υ	N N	U	N/A N/A
3.	Air-operated gate or globe valve with spring-opposed dia pneumatic actuator	Υ	N	U	N/A
4.	Use amplified response spectrum of piping system at pip valve interface	y Y	N	U	N/A
5.	Valve and operator will not impact surrounding structure				NI/A
	components	Y	N N	U	N/A N/A
6. 7.	Mounted on 1- to 3-inch nominal pipe line Carbon steel (not cast iron) yoke or bonnet	Y	N	Ü	N/A
	intent of all the caveats met for GERS?	Y	N	U	N/A
Anc	horage (Chapter 6)				
1.	Type of anchorage:				
	expansion anchor				
	cast-in-place bolt or headed stud ancho	r			
	cast-in-place J-bolt				
	grouted-in-place bolt				
	welds to embedded steel on exposed st	eel			
	lead cinch anchors				
	Other				
	□ N/A (no further anchorage consideration	ns)			
2.	Appropriate characteristics for anchorage type checked		. .		
_	(size, location, equipment characteristics)	Y	N	U	A#/A
3.	Gap at threaded anchor less than 1/4 inch	Y ents met Y	N N	U	N/A
4. 5	Base stiffness and no significant prying action requirement Equipment base strength and structural load path adequ		N	U	
5. 6.	Embedment steel and pads requirements met	rate 1	N	Ü	N/A
	Embedment length requirements met	Ý	N	Ŭ	14/1
7				_	
7. 8.	Anchor spacing requirements met	Y	N	U	

SEWS 8.2.1 (3 of 4)

.qui	pment ID No.:	uipment Class: Flu Air	: Fluid-Operated/ Air-Operated Valves						
Equipment description:									
	horage (Cont.)								
10.	Concrete strength requirements met		Y	N	U				
11.	Concrete crack requirements met		Ϋ́	N	U				
12.	Equipment with essential relays requirements met		Ý	N	Ü	N/A			
13.	Installation adequacy requirements met		Ý	N	Ü	N/A			
14.	No other concerns		Ý	N	Ü				
Does	anchorage capacity exceed demand?		Y	N	U				
	ence:								
Inte	raction Effects (Chapter 7)								
1.	Soft targets free from impact by nearby equipment								
	or structures		Υ	N	U	N/A			
2.	If equipment contains sensitive essential relays, equi	ipment free							
	from all impact by nearby equipment or structures		Υ	Ν	U	N/A			
3.	Attached lines have adequate flexibility		Y	Ν	U	N/A			
4.	No collapse of overhead equipment, distribution syst	ems,							
	or masonry walls		Υ	N		N/A			
5.	Equipment is free from credible and significant								
	seismic-induced flood and spray concerns		Υ	N	U	N/A			
6 .	No credible seismic-induced fire concerns		Y	N		N/A			
7.	No other "two over one" concerns as defined in DOE	-STD-1021	Y	N		N/A			
3.	No other concerns		Y	N	U	N/A			
s equ	uipment free of interaction effects?		Y	N	U				
	nments								

SEWS 8.2.1 (4 of 4)

	pment ID No.:			Equipment Class:	Fluid-Operated/ Air-Operated Valves
Equi	oment description	1:			
Con	nments (Cont.)				
Scre	ening Walkdown((s):			
	<u>Date</u>	Time	Team Member	<u>rs</u>	
Rec	ommend Res	olution			
Rec	ommend Res				
		action:			
۵	Maintenance	action:			
<u> </u>	Maintenance Further evalu	action:			
0 0	Maintenance Further evalue Retrofit desig Other:	action: ation: n:	Equipment is seism	nically adequate.	
0 0 0	Maintenance Further evalue Retrofit desig Other: No further act	action: ation: n: tion required.	Equipment is seism		
C All as	Maintenance Further evalue Retrofit desig Other: No further act	action: ation: n: tion required. ipment's seisi	mic adequacy have		Date:
All as	Maintenance Further evalue Retrofit desig Other: No further act	action: ation: n: tion required. ipment's seisi	mic adequacy have	been addressed.	
All as	Maintenance Further evalue Retrofit desig Other: No further act spects of the equivation by:	action: ation: n: tion required. ipment's seis	mic adequacy have	been addressed.	

SEWS 8.2.2 MOV (1 of 4)

SCREENING EVALUATION	N WORK SHEET (SEW	IS)					
Equipment ID No.:	Equipment Class: Motor-Operated Valves						
Equipment description:							
Equipment Location: Bldg.	Floor El.	Room, R	ow/Co	<u>.</u>			
Manufacturer, model, etc.:							
Smallest pipe diameter attached to valve:							
Pipe centerline to top of motor actuator length:							
Valve material:	e material: Yoke material:						
Weight:							
Drawing No.:	Performance Category:						
Functionality Requirement							
For components whose function or structural integral For all other components, only anchorage evaluate Seismic Capacity vs. Demand (Chapter 5)		I sections	of this f	orm.			
1. Seismic Capacity based on: Reference Spectrum GERS Existing documentation 2. Elevation where equipment receives seismic inpose Seismic Demand Spectrum (SDS) based on: In-structure response spectrum Other in-structure response spectrum Scale factor) Design basis earthquake (DBE) Other Scale Factor (SF) Ex Does capacity exceed demand? Reference:	(IRS) per DOE-STD-1020 ectrum (determine appropria) per DOE-STD-1020 perience Data Factor (F _{ED})	ate experie	nce da	ta			
Caveats (Section 8.2.2) Reference Spectrum (Identify with an asterisk (*) the meeting the specific wording of the caveat rule and expecting the specific wording of the caveat rule and expecting the specific wording of the caveat rule and expecting the specific wording of the caveat rule and expecting the specific wording of the caveat rule and expecting the specific wording of the caveat rule and expecting the specific wording of the caveat rule and expecting the specific wording the sp	nose caveats which are met lain the reason for this cond	by intent v	without ne				
COMMENTS section below)							
 Equipment is included in earthquake experience No cast-iron body No cast-iron yoke 	equipment class	Y N Y N Y N	U U	N/A N/A N/A			

SEWS 8.2.2 MOV (2 of 4)

quipment ID No.: Equipment Class: Mo	otor-Op	erate	d Valv	es
quipment description:				
Caveats (Cont.)				
Mounted on 1-inch diameter pipe or larger	Y	N	U	N/A
Centerline of pipe to operator within restrictions or yoke can take	Υ	N	U	N/A
static 3g load	Ϋ́Υ	N N	U	N/A
 Actuator and yoke not braced independently from pipe Have you looked for and found no other adverse concerns? 	Y	N	U	N/A
. Have you looked for and found no other adverse concerns?	•	14	Ü	13/74
the intent of all the caveats met for Reference Spectrum?	Υ	N	U	N/A
GERS (Identify with an asterisk (*) those caveats which are met by intent without ording of the caveat rule and explain the reason for this conclusion in the CON Note that GERS for this class apply to only motor operator and its connection to alve/pipe interface are not covered.)	IMENTS	S secti	on bel	ow) Ind
Equipment is included in generic seismic testing equipment class		N	U	N/A
Meets all Reference Spectrum caveats	Y	N	U	N/A
 Use amplified spectrum of piping system and valve at valve/operator interface 	Υ	N	U	N/A
valve/operator interface Motor axis is horizontal	Ý	N	ŭ	N/A
Note: axis is notize that Nalve and operator will not impact surrounding structures and	٠		_	
components	Y	N	U	N/A
Motor controls remotely located If valve has side mounted actuator attached to secondary reducer, seismic brackets are used Manufactured by Limitorque or Rotork Any loose or missing valve-to-operator bolts are tightened or replaced	Y	N	U	N/A
(tightness check not required)				
s the intent of all the caveats met for GERS?	Υ	N	U	N/A
Anchorage (Chapter 6)				
Type of anchorage:				
expansion anchor				
معطمهم المربان المصاحب المراجع				
cast-in-place bolt or headed stud anchor				
cast-in-place J-bolt cast-in-place J-bolt				
cast-in-place J-boltgrouted-in-place bolt				
cast-in-place J-bolt				
cast-in-place J-boltgrouted-in-place bolt				
 cast-in-place J-bolt grouted-in-place bolt welds to embedded steel on exposed steel lead cinch anchors Other 				
 cast-in-place J-bolt grouted-in-place bolt welds to embedded steel on exposed steel lead cinch anchors 				
□ cast-in-place J-bolt □ grouted-in-place bolt □ welds to embedded steel on exposed steel □ lead cinch anchors □ Other □ N/A (no further anchorage considerations)				
cast-in-place J-bolt grouted-in-place bolt welds to embedded steel on exposed steel lead cinch anchors Other N/A (no further anchorage considerations) Appropriate characteristics for anchorage type checked	Y	N	U	-
□ cast-in-place J-bolt □ grouted-in-place bolt □ welds to embedded steel on exposed steel □ lead cinch anchors □ Other □ N/A (no further anchorage considerations)	Y	N N	U	N/A

SEWS 8.2.2 MOV (3 of 4)

Equi	pment ID No.: Equipmen	t Class: Motor-Op	erated	l Valve	es
Equip	oment description:				
Anc	horage (Cont.)				
5.	Equipment base strength and structural load path adequate	Υ	N	U	
6.	Embedment steel and pads requirements met	Υ	Ν	Ū	N/A
7.	Embedment length requirements met	Υ	N	U	
8.	Anchor spacing requirements met	Υ	N	U	
9.	Edge distance requirements met	Υ	Ν	U	
10.	Concrete strength requirements met	Υ	N	U	
l1.	Concrete crack requirements met	Υ	N	U	
12.	Equipment with essential relays requirements met	Υ	N	U	N/A
13.	Installation adequacy requirements met	Υ	Ν	U	N/A
4.	No other concerns	Υ	Ν	U	
)oes	anchorage capacity exceed demand?	Y	N	U	
Refer	ence:				
Inter	raction Effects (Chapter 7)				
1.	Soft targets free from impact by nearby equipment				
	or structures	Υ	Ν	U	N/A
2.	If equipment contains sensitive essential relays, equipment	free			
	from all impact by nearby equipment or structures	Υ	Ν	U	N/A
3.	Attached lines have adequate flexibility	Υ	Ν	U	N/A
٠.	No collapse of overhead equipment, distribution systems,				
	or masonry walls	Υ	N		N/A
5 .	Equipment is free from credible and significant				
	seismic-induced flood and spray concerns	Υ	N	U	N/A
3 .	No credible seismic-induced fire concerns	Υ	N		N/A
7 .	No other "two over one" concerns as defined in DOE-STD-1	021 Y	N		N/A
}.	No other concerns	Y	N	U	N/A
s equ	uipment free of interaction effects?	Y	N	U	
	iments				

SEWS 8.2.2 MOV (4 of 4)

	SCF	REENING E	EVALUATION WO	ORK SHEET (SEWS)	(Cont.)
Equipm	ent ID No.:			Equipment Class: Motor	r-Operated Valves
Equipme	ent description:				
Comm	ents (Cont.)				
Screenir	ng Walkdown(s)):			
<u> </u>	<u>Date</u>	<u>Time</u>	Team Members		
Recon	nmend Reso	olution			
	Maintenance a	ction:			
	Further evalua	tion:			
٥	Retrofit design	:			
	Other:				
	No further action	on required.	Equipment is seismic	ally adequate.	
All aspe	cts of the equip	oment's seisn	nic adequacy have be	een addressed.	
Evaluati					Date:
(All tean	n members)				
	-				
	•				

SEWS 8.2.2 SOV (1 of 4)

SCREENING EVALUATION	WORK SHEET (SEV	VS)			
Equipment ID No.:	Equipment Class: Sole	noid-	Opera	ted V	alves
Equipment description:					
Equipment Location: Bldg.	Floor El.	Roo	om, R	ow/Co	l
Manufacturer, model, etc.:					
Smallest pipe diameter attached to valve:					
Pipe centerline to top of motor actuator length:					
Valve material:	Yoke material:				
Weight:					
Drawing No.:	Performance Category:				
Functionality Requirement					
Contact Lead Relay Reviewer to determine if item For components whose function or structural integ For all other components, only anchorage evaluation	rity is required, complete a	ll sec	tions o	of this t	form.
Seismic Capacity vs. Demand (Chapter 5)					
 Seismic Capacity based on: Reference Spectrum GERS Existing documentation Elevation where equipment receives seismic inposeismic Demand Spectrum (SDS) based on: In-structure response spectrum Other in-structure response spectrum scale factor) 	(IRS) per DOE-STD-1020	ate ex	perier	nce da	ta
Design basis earthquake (DBE) Other	per DOE-STD-1020				
Scale Factor (SF) Ex	perience Data Factor (F _{ED})				
Does capacity exceed demand?		Y	N	U	
Reference:					
Caveats (Section 8.2.2)					
Reference Spectrum (Identify with an asterisk (*) the meeting the specific wording of the caveat rule and explication (COMMENTS section below)					
 Equipment is included in earthquake experience No cast-iron body No cast-iron yoke 	equipment class	Y Y Y	N N N	U U	N/A N/A N/A

SEWS 8.2.2 SOV (2 of 4)

Equip	ment ID No.:	Equipment Class: Sole	enoid	-Oper	ated V	/alves
Equip	ment description:					
Cave	Mais (Cont.)					
1.	Centerline of pipe to operator within restrictions of	or yoke can take				
	static 3g load	•	Υ	N	U	N/A
5.	Actuator and yoke not braced independently from	n pipe	Υ	N	U	N/A
8.	Have you looked for and found no other adverse	concerns?	Υ	N	U	N/A
s the	intent of all the caveats met for Reference Spectru	m?	Y	N	U	N/A
vordir Note	S (Identify with an asterisk (*) those caveats which ag of the caveat rule and explain the reason for this that GERS for this class apply to only motor operatoripe interface are not covered.)	conclusion in the COMM	IENTS	S secti	on bel	ow)
l	Equipment is included in generic seismic testing	equipment class	Υ	N	U	N/A
2.	Meets all Reference Spectrum caveats	• •	Υ	N	U	N/A
3.	Use amplified spectrum for piping system at piping		Υ	N	U	N/A
1.	Valve and operator will not impact surrounding s	tructures and				
_	components		Y	N	Ü	N/A
<u>5</u> .	Nominal pipe size is 1 inch or less		Y	N	U	N/A
<u>}</u> .	Valve body is forged brass or steel		Y	N	U	N/A
7.	Housing oriented in accordance with manufactur		Y	N	U	N/A
3.	Height of valve (pipe centerline to top of housing		Υ	N	U	N/A
).	If SOV is a pilot on a larger valve, use amplified attachment point of SOV to larger valve	response spectrum at	Υ	N	U	N/A
0.	Use 3.5g ZPA GERS for ASCO Type 206-381		Ÿ	N	Ü	N/A N/A
	-		•	14		INA
s the	intent of all the caveats met for GERS?		Υ	N	U	N/A
Anci	norage (Chapter 6)					
1.	Type of anchorage:			_		
	expansion anchor					
	cast-in-place bolt or headed student	d anchor				
	cast-in-place J-bolt					
	grouted-in-place bolt					
	welds to embedded steel on exp	nosad stael				
	•	voseu sleei				
	lead cinch anchors					
	Other	derations)				
	Other	derations				
2.	N/A (no further anchorage consi					
2.	N/A (no further anchorage consi		Y	N	U	
2. 3.	N/A (no further anchorage consi		Y Y	N N	U	N/A
	N/A (no further anchorage consi Appropriate characteristics for anchorage type cl (size, location, equipment characteristics)	hecked				N/A
3.	N/A (no further anchorage consi Appropriate characteristics for anchorage type of (size, location, equipment characteristics) Gap at threaded anchor less than 1/4 inch	hecked quirements met	Y	N	U	N/A

SEWS 8.2.2 SOV (3 of 4)

7. Embedment length requirements met 8. Anchor spacing requirements met 9. Edge distance requirements met 10. Concrete strength requirements met 11. Concrete crack requirements met 12. Equipment with essential relays requirements met 13. Installation adequacy requirements met 14. No other concerns 15. No other concerns 16. Soft targets free from impact by nearby equipment 17. or structures 18. Soft targets free from impact by nearby equipment free 19. If equipment contains sensitive essential relays, equipment free 19. If equipment contains sensitive essential relays, equipment free 19. Attached lines have adequate flexibility 19. No collapse of overhead equipment, distribution systems, 19. or masonry walls 19. Fequipment is free from credible and significant 19. Soft requirement is free from credible and significant 19. Sequipment is free from credible and significant 19. Soft requirement is free from credible and significant 19. Soft requirement is free from credible and significant 19. Soft requirements met 19. No credible seismic-induced fire concerns 19. No other "two over one" concerns as defined in DOE-STD-1021 20. No other "two over one" concerns as defined in DOE-STD-1021
8. Anchor spacing requirements met 9. Edge distance requirements met 9. Edge distance requirements met 9. Concrete strength requirements met 9. N U 10. Concrete strength requirements met 9. N U 11. Concrete crack requirements met 9. N U 12. Equipment with essential relays requirements met 9. N U 13. Installation adequacy requirements met 9. N U 14. No other concerns 9. N U 15. Occes anchorage capacity exceed demand? 16. Soft targets free from impact by nearby equipment 17. or structures 18. Attached ines have adequate flexibility 19. No collapse of overhead equipment, distribution systems, 19. or masonry walls 19. Equipment is free from credible and significant 19. Segmination of the concerns
7. Embedment length requirements met 8. Anchor spacing requirements met 9. Edge distance requirements met 10. Concrete strength requirements met 11. Concrete crack requirements met 12. Equipment with essential relays requirements met 13. Installation adequacy requirements met 14. No other concerns 15. No other concerns 16. Soft targets free from impact by nearby equipment 17. or structures 18. Attached lines have adequate flexibility 19. No collapse of overhead equipment, distribution systems, or masonry walls 19. Equipment is free from credible and significant seismic-induced flood and spray concerns 19. No credible seismic-induced fire concerns as defined in DOE-STD-1021 19. No other "two over one" concerns as defined in DOE-STD-1021
9. Edge distance requirements met 10. Concrete strength requirements met 11. Concrete crack requirements met 12. Equipment with essential relays requirements met 13. Installation adequacy requirements met 14. No other concerns 15. No other concerns 16. Soft targets free from impact by nearby equipment 17. or structures 18. Attached lines have adequate flexibility 19. Attached lines have adequate flexibility 19. No collapse of overhead equipment, distribution systems, 19. Tequipment is free from credible and significant 19. Seismic-induced flood and spray concerns 19. No credible seismic-induced fire concerns 19. No other "two over one" concerns as defined in DOE-STD-1021 19. No unique the properties of th
10. Concrete strength requirements met 11. Concrete crack requirements met 12. Equipment with essential relays requirements met 13. Installation adequacy requirements met 14. No other concerns 15. No other concerns 16. Soft targets free from impact by nearby equipment 17. or structures 18. Attached lines have adequate flexibility 18. No collapse of overhead equipment, distribution systems, 18. Or masonry walls 18. Equipment is free from credible and significant 18. Sequipment is free from credible and si
1. Concrete crack requirements met 2. Equipment with essential relays requirements met 3. Installation adequacy requirements met 4. No other concerns 7 N U 4. No other concerns 7 N U 6. Soft targets free from impact by nearby equipment 7 or structures 7 N U 7 If equipment contains sensitive essential relays, equipment free 7 from all impact by nearby equipment or structures 7 N U 8. Attached lines have adequate flexibility 8 N C C C C C C C C C C C C C C C C C C
2. Equipment with essential relays requirements met 3. Installation adequacy requirements met 4. No other concerns 7 N U 4. No other concerns 7 N U 5. Soft targets free from impact by nearby equipment 7 or structures 7 N U 8 N O collapse of overhead equipment, distribution systems, 7 Or masonry walls 8 N Equipment is free from credible and significant 8 seismic-induced flood and spray concerns 8 N N O credible seismic-induced fire concerns 9 N N U 8 N O credible seismic-induced fire concerns 9 N N U 8 N O credible seismic-induced fire concerns 9 N N U 9 N O credible seismic-induced fire concerns 9 N N U 9 N O credible seismic-induced fire concerns 9 N N U
3. Installation adequacy requirements met 4. No other concerns 7 N U 4. No other concerns 7 N U 5 Oces anchorage capacity exceed demand? 7 N U 6 Reference: Interaction Effects (Chapter 7) Soft targets free from impact by nearby equipment 7 or structures 7 N U 7 N U 8 If equipment contains sensitive essential relays, equipment free 8 from all impact by nearby equipment or structures 9 N U 9 Attached lines have adequate flexibility 9 N O collapse of overhead equipment, distribution systems, 9 or masonry walls 9 N C Equipment is free from credible and significant 9 seismic-induced flood and spray concerns 9 N U 9 N O credible seismic-induced fire concerns 9 N O ON O COLLEGE OF TO
4. No other concerns Y N U Does anchorage capacity exceed demand? Y N U Reference: Interaction Effects (Cnapter 7) Soft targets free from impact by nearby equipment or structures Y N U If equipment contains sensitive essential relays, equipment free from all impact by nearby equipment or structures Y N U Attached lines have adequate flexibility Y N U No collapse of overhead equipment, distribution systems, or masonry walls Fequipment is free from credible and significant seismic-induced flood and spray concerns Y N U No credible seismic-induced fire concerns Y N U No other "two over one" concerns as defined in DOE-STD-1021 Y N
Does anchorage capacity exceed demand? **Reference:
Interaction Effects (Chapter 7) Soft targets free from impact by nearby equipment or structures YNUU If equipment contains sensitive essential relays, equipment free from all impact by nearby equipment or structures YNUU Attached lines have adequate flexibility YNUU No collapse of overhead equipment, distribution systems, or masonry walls YNUE equipment is free from credible and significant seismic-induced flood and spray concerns YNUUU No credible seismic-induced fire concerns YNUUU No other "two over one" concerns as defined in DOE-STD-1021 YNUUU
Interaction Effects (Chapter 7) Soft targets free from impact by nearby equipment or structures If equipment contains sensitive essential relays, equipment free from all impact by nearby equipment or structures Attached lines have adequate flexibility No collapse of overhead equipment, distribution systems, or masonry walls Equipment is free from credible and significant seismic-induced flood and spray concerns No credible seismic-induced fire concerns No other "two over one" concerns as defined in DOE-STD-1021 Y
Soft targets free from impact by nearby equipment or structures YNUU If equipment contains sensitive essential relays, equipment free from all impact by nearby equipment or structures YNUU Attached lines have adequate flexibility YNUU No collapse of overhead equipment, distribution systems, or masonry walls YNUEquipment is free from credible and significant seismic-induced flood and spray concerns YNUUU No credible seismic-induced fire concerns YNUUUU No other "two over one" concerns as defined in DOE-STD-1021 YNUUUU
or structures YNU If equipment contains sensitive essential relays, equipment free from all impact by nearby equipment or structures YNU Attached lines have adequate flexibility YNU No collapse of overhead equipment, distribution systems, or masonry walls YNU Equipment is free from credible and significant seismic-induced flood and spray concerns YNU No credible seismic-induced fire concerns YNU No other "two over one" concerns as defined in DOE-STD-1021 YNU
If equipment contains sensitive essential relays, equipment free from all impact by nearby equipment or structures Attached lines have adequate flexibility No collapse of overhead equipment, distribution systems, or masonry walls Equipment is free from credible and significant seismic-induced flood and spray concerns No credible seismic-induced fire concerns No other "two over one" concerns as defined in DOE-STD-1021 Y N
from all impact by nearby equipment or structures Attached lines have adequate flexibility No collapse of overhead equipment, distribution systems, or masonry walls Equipment is free from credible and significant seismic-induced flood and spray concerns No credible seismic-induced fire concerns No other "two over one" concerns as defined in DOE-STD-1021 Y N U
Attached lines have adequate flexibility No collapse of overhead equipment, distribution systems, or masonry walls Equipment is free from credible and significant seismic-induced flood and spray concerns No credible seismic-induced fire concerns No other "two over one" concerns as defined in DOE-STD-1021 Y N U N V N N
No collapse of overhead equipment, distribution systems, or masonry walls Equipment is free from credible and significant seismic-induced flood and spray concerns No credible seismic-induced fire concerns No other "two over one" concerns as defined in DOE-STD-1021 Y N
or masonry walls Equipment is free from credible and significant seismic-induced flood and spray concerns No credible seismic-induced fire concerns No other "two over one" concerns as defined in DOE-STD-1021 Y N
Equipment is free from credible and significant seismic-induced flood and spray concerns Y N U No credible seismic-induced fire concerns Y N No other "two over one" concerns as defined in DOE-STD-1021 Y N
seismic-induced flood and spray concerns Y N U No credible seismic-induced fire concerns Y N No other "two over one" concerns as defined in DOE-STD-1021 Y N
No credible seismic-induced fire concerns YN No other "two over one" concerns as defined in DOE-STD-1021 YN
7. No other "two over one" concerns as defined in DOE-STD-1021 Y N
. No other concerns
s equipment free of interaction effects? Y N U
Comments

SEWS 8.2.2 SOV (4 of 4)

Sheet 4 of	She	et 4	4 of	f	
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	SCREENIN	IG EVALU	ATION W	ORK SHEE	T (SEWS)	(Cont.)	
Equipment ID N	lo.:			Equipment	Class: Sole	noid-Operat	ed Valves
Equipment desc	ription:						
Comments (Cont.)						
Recommend	Resolution						
☐ Mainten	ance action: _						
☐ Further	evaluation: _						
☐ Retrofit of	design: _						
Other:	-						
□ No furth	er action require	ed. Equipme	nt is seismic	ally adequate			
All aspects of the	e equipment's s	eismic adequ	acy have be	en addressed	j.	•	
Evaluation by:	-					_ Date:	
(All team member	ers)					-	
	-					_	
						_	

SEWS 8.2.3 (1 of 3)

Equipment ID No.:		Equipment Clas	s: Horizon	tal Pur	nps	
Equipment description	on:					
Equipment Location:	Bldg.	Floor El.	P	oom, F	Row/Co	ol.
Manufacturer, model	l, etc.:					
Drawing No.:		Performance Ca	tegory:			
Weight:						
Horsepower/Motor ra	ating: RPM	Head	F	low rate	€	
Functionality Re	equirement					
For componen	Relay Reviewer to determine ts whose function or structuomponents, only anchorage	ral integrity is required, cor		ections	of this	form.
Seismic Capacit	ty vs. Demand (Chapter :	5)				
	Other in-structure respo scale factor)	d on: pectrum (IRS) per DOE-ST nse spectrum (determine a e (DBE) per DOE-STD-102	appropriate	experie	nce da	ata
Scal	e Factor (SF)	_ Experience Data Fact	or (F _{ED})			
Does capacity excee	ed demand?		Υ	N	U	
Reference:						
Caveats (Section 8	(,2.3)					
Reference Spect	rum (Identify with an asteri wording of the caveat rule a					t
 Equipment is Driver and pu Shaft has thru 	included in earthquake expe mp connected by rigid base ust restraint in both axial dire	or skid ections	Y Y Y	N N N	U U	N/A N/A N/A
or differentia	essive nozzle loads such as al displacement ked for and found no other a		Y	N N	U	N/A N/A
Have you lool	ked for and found no other a	uverse concerns:	1		•	

SEWS 8.2.3 (2 of 3)

	pment ID No.: Equipment ID No.:	ment Class: Horizont	al Pur	nps	
Equip	oment description:				
Anc	horage (Chapter 6)				
۱.	Type of anchorage:				
	expansion anchor				
	cast-in-place bolt or headed stud anchor				
	cast-in-place J-bolt				
	grouted-in-place bolt				
	welds to embedded steel on exposed ste	el			
	lead cinch anchors				
	Other				
	N/A (no further anchorage considerations	s)			
2.	Appropriate characteristics for anchorage type checked				
	(size, location, equipment characteristics)	Υ	Ν	U	
3.	Gap at threaded anchor less than 1/4 inch	Υ	Ν	U	N/A
4.	Base stiffness and no significant prying action requirement		N	U	
5.	Equipment base strength and structural load path adequa		N	U	
6. 7	Embedment steel and pads requirements met	Y	N	U	N/A
7.	Embedment length requirements met	Y	N	U	
8. 9.	Anchor spacing requirements met Edge distance requirements met	Y	N N	U	
9. 0.	Concrete strength requirements met	Y	N	U	
1.	Concrete crack requirements met	Ý	N	Ü	
2.	Equipment with essential relays requirements met	Ý	N	Ü	N/A
3.	Installation adequacy requirements met	Ý	N	Ŭ	N/A
4.	No other concerns	Y	N	Ū	
oes	anchorage capacity exceed demand?	Υ	N	U	
Refer	rence:				
nte	raction Effects (Chapter 7)				
•	Soft targets free from impact by nearby equipment				
	or structures	Υ	N	U	N/A
2.	If equipment contains sensitive essential relays, equipme				51/4
3.	from all impact by nearby equipment or structures Attached lines have adequate flexibility	Y	N N	U	N/A N/A
). ·.	No collapse of overhead equipment, distribution systems		IN	U	IN/A
•	or masonry walls	Υ Υ	N		N/A
i.	Equipment is free from credible and significant	•	1.4		13/7
•	seismic-induced flood and spray concerns	Υ	N	U	N/A
	No credible seismic-induced fire concerns	Ý	N	-	N/A
i.	No other "two over one" concerns as defined in DOE-STI	D-1021 Y	N		N/A
). '.	140 Other 1440 Over one concerns as defined in DOL-OTE				
	No other concerns	Y	Ν	U	N/A

SEWS 8.2.3 (3 of 3)

	SCF	REENING E	VALUATION W	ORK SHEET (SEWS) ((Cont.)
Equip	ment ID No.:			Equipment Class: Horizo	ntal Pumps
Equipr	nent description:	:			
Com	ments				
Screen	ning Walkdown(s	s):			
	<u>Date</u>	<u>Time</u>	Team Members	3	
Reco	mmend Res	olution			
	Maintenance a	action:			
	Further evalua	ation:			
٥	Retrofit design	n:			
۵	Other:				
<u> </u>	No further acti	ion required.	Equipment is seism	cally adequate.	
All as	pects of the equi	pment's seisn	nic adequacy have b	een addressed.	
	ation by:				Date:
(All te	am members)				

		,	
	•		

SEWS 8.2.4 (1 of 3)

SCREENING EVALUATIO	N WORK SHEET	(SEWS)		
Equipment ID No.:	Equipment Class	: Vertical	Pumps	3	
Equipment description:					
Equipment Location: Bldg.	Floor El.	R	oom, F	low/Co	ol.
Manufacturer, model, etc.:					
Drawing No.:	Performance Cate	gory:			
Weight:				-	
Horsepower/Motor rating: RPM	Head	F	ow rate	9	
Functionality Requirement					
Contact Lead Relay Reviewer to determine if item For components whose function or structural integ For all other components, only anchorage evaluation	rity is required, comp		ctions	of this	form.
Seismic Capacity vs. Demand (Chapter 5)					
 Seismic Capacity based on: Reference Spectrum GERS Existing documentation Elevation where equipment receives seismic inp Seismic Demand Spectrum (SDS) based on: 	(IRS) per DOE-STD- ctrum (determine ap	propriate e	experie	nce da	uta.
Does capacity exceed demand? Reference:	_	Y	N	U	_
Caveats (Section 8.2.4)					
Reference Spectrum (Identify with an asterisk (*) the meeting the specific wording of the caveat rule and explain COMMENTS section below)	ain the reason for this	s conclusio	on in th	е	
 Equipment is included in earthquake experience et Casing and impeller shaft not cantilevered more t 		Y	N	U	N/A
with radial bearing at bottom to support shaft 3. No risk of excessive nozzle loads such as gross p	·	Y	N	U	N/A
or differential displacement	•	Y	N	U	N/A
4. Have you looked for and found no other adverse		Y	N	U	N/A
Is the intent of all the caveats met for Reference Spectru	ım?	Y	N	U	N/A

SEWS 8.2.4 (2 of 3)

qui	pment ID No.: Equi	ment Class: Vertical Pumps	
Equip	oment description:		
4MC	horage (Chapter 6)		
•	Type of anchorage: expansion anchor		
	cast-in-place bolt or headed stud anch	NP.	
	cast-in-place John of Headed stud affern)I	
	grouted-in-place bolt		
	· · · · · · · · · · · · · · · · · · ·	tool	
	welds to embedded steel on exposed steellead cinch anchors	teer	
		>	
	N/A (no further anchorage consideration	ns)	
2.	Appropriate characteristics for anchorage type checked		
	(size, location, equipment characteristics)	Y N U	
3.	Gap at threaded anchor less than 1/4 inch	Y N U	N/A
4.	Base stiffness and no significant prying action requiren		
5.	Equipment base strength and structural load path adec		
6. 	Embedment steel and pads requirements met	Y N U	N/A
7.	Embedment length requirements met	Y N U	
8.	Anchor spacing requirements met	Y N U	
9.	Edge distance requirements met	Y N U	
0.	Concrete strength requirements met	Y N U	
1.	Concrete crack requirements met	Y N U	B1/A
2.	Equipment with essential relays requirements met	Y N U Y N U	N/A
3.	Installation adequacy requirements met	- · · · · · · · · · · · · · · · · · · ·	N/A
4.	No other concerns	Y N U	
oes	anchorage capacity exceed demand?	Y N U	
Refe	rence:		
nte	raction Effects (Chapter 7)		
•	Soft targets free from impact by nearby equipment		
	or structures	Y N U	N/A
	If equipment contains sensitive essential relays, equipr		
	from all impact by nearby equipment or structures	Y N U	N/A
	Attached lines have adequate flexibility	Y N U	N/A
•	No collapse of overhead equipment, distribution system		NI/A
	or masonry walls	Y N	N/A
	Equipment is free from credible and significant	V N 11	NI/A
	seismic-induced flood and spray concerns No credible seismic-induced fire concerns	Y N U Y N	N/A N/A
i. ,	No other "two over one" concerns as defined in DOE-S		N/A
}.	No other concerns No other concerns	Y N U	N/A
•	NO OTHER CONCERNS	1 14 0	14/74

SEWS 8.2.4 (3 of 3)

	SCI	REENING	EVALUATION W	ORK SHEET (SEW	S) (Cont.)
Equip	ment ID No.:			Equipment Class: Ve	
Equip	ment description	:			
Com	ments				
Scree	ning Walkdown(s	s):			
	<u>Date</u>	<u>Time</u>	Team Members	<u> </u>	
					'
Reco	ommend Res	olution			
	Maintenance a	action:			
	Further evalua	ation:			
۵	Retrofit design	n:			
۵	Other:				
	No further acti	ion required.	Equipment is seismi	cally adequate.	
All as	pects of the equi	pment's seis	mic adequacy have b	een addressed.	
Evalu	ation by:				Date:
(All te	am members)				

		·	

control density of the experience

SEWS 8.2.5 (1 of 3)

SCREENING EVALUATION	N WORK SHEET (S	SEWS)			
Equipment ID No.:	Equipment Class: C	hillers			
Equipment description:					
System:					
Equipment Location: Bldg.	Floor El.	Ro	om, R	ow/Co	d
Manufacturer, model, etc.:					
Weight:					
Drawing No.:	Performance Categor	y:			
Functionality Requirement					
Contact Lead Relay Reviewer to determine if iter For components whose function or structural inter For all other components, only anchorage evaluations.	grity is required, complet	-	tions (of this	form.
Seismic Capacity vs. Demand (Chapter 5)					
Seismic Capacity based on: Reference Spectrum GERS Existing documentation Elevation where equipment receives seismic in Seismic Demand Spectrum (SDS) based on: In-structure response spectrum Other in-structure response spectrum scale factor) Design basis earthquake (DBE Other	n (IRS) per DOE-STD-10 ectrum (determine appro	priate ex	kperie:	nce da	ıta
Scale Factor (SF) E	perience Data Factor (F	ED)			
Does capacity exceed demand?		Y	N	U	
Reference:					
Caveats (Section 8.2.5)					
Reference Spectrum (Identify with an asterisk (*) meeting the specific wording of the caveat rule and exp COMMENTS section below)					
 Equipment is included in earthquake experience Evaporator and condenser tanks reasonably bra themselves for lateral forces without relying or 	iced between n weak-way	Υ	N	U	N/A
bending of steel plates or structural steel shap 3. Have you looked for and found no other adverse	es e concerns?	Y	N N	U	N/A N/A
Is the intent of all the caveats met for Reference Spect	rum?	Y	N	U	N/A

SEWS 8.2.5 (2 of 3)

Equipment ID No.: Equipment Class: Chillers									
quip	ment description:			·					
Incl	norage (Chapter 6)								
11161	Type of anchorage:			<u> </u>	. e.g., gid Ne				
•	expansion anchor								
	cast-in-place bolt or headed stud and	hor							
	cast-in-place J-bolt	···-							
	grouted-in-place bolt								
	welds to embedded steel on expose	i steel							
	lead cinch anchors								
	Other								
	N/A (no further anchorage considera	tions)							
2.	Appropriate characteristics for anchorage type check	ed							
۷.	(size, location, equipment characteristics)	eu Y	N	U					
3.	Gap at threaded anchor less than 1/4 inch	Y	N	IJ	N/A				
3. 4.	Base stiffness and no significant prying action require		N	Ŭ	. 4/71				
4. 5.	Equipment base strength and structural load path ad		N	Ü					
5. 6.	Embedment steel and pads requirements met	Y	N	Ŭ	N/A				
7.	Embedment length requirements met	Ϋ́	N	Ū					
8.	Anchor spacing requirements met	Y	N	Ū					
9.	Edge distance requirements met	Υ	N	U					
10.	Concrete strength requirements met	Υ	N	U					
11.	Concrete crack requirements met	Y	N	U					
12.	Equipment with essential relays requirements met	Y	N	U	N/A				
13.	Installation adequacy requirements met	Y	N	U	N/A				
4.	No other concerns	Y	N	U					
oes	anchorage capacity exceed demand?	Y	N	U					
Refer	ence:								
	and a Steel of the state of the								
intei i.	raction Effects (Chapter 7) Soft targets free from impact by nearby equipment								
	or structures	Υ	N	U	N/A				
2.	If equipment contains sensitive essential relays, equ		_	-					
	from all impact by nearby equipment or structures	Y	N	U	N/A				
3.	Attached lines have adequate flexibility	Υ	N	U	N/A				
4.	No collapse of overhead equipment, distribution syst	ems,			A 1/4				
_	or masonry walls	Υ	N		N/A				
5.	Equipment is free from credible and significant	\ /	K.I	U	N/A				
	seismic-induced flood and spray concerns	Y	N N	U	N/A N/A				
3. 7	No credible seismic-induced fire concerns No other "two over one" concerns as defined in DOE		N		N/A				
7.		-51D-1021 f Y	N N	υ	N/A				
3.	No other concerns	·			14/27				
	uipment free of interaction effects?	Y	N	U					

SEWS 8.2.5 (3 of 3)

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Sn	eet	.3	ΩT	

	SCF	REENING E	VALUATION W	ORK SHEET (SEWS)	(Cont.)
Equip	ment ID No.:			Equipment Class: Chille	
Equipn	nent description:	:			
Comi	nents				
Screen	ing Walkdown(s	s):			
	<u>Date</u>	<u>Time</u>	Team Members		
Reco	mmend Res	olution			
	Maintenance a	action:			
	Further evalua	ition:			
	Retrofit design	ı:			
	Other:				
	No further acti	on required. E	quipment is seismi	cally adequate.	
All asp	ects of the equip	pment's seismi	c adequacy have b	een addressed.	
Evalua	ition by:	<u></u>			Date:
(All tea	ım members)				

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ego				
			•	
and the second s				
The state of the s				
Common to the common of the co				

SEWS 8.2.6 (1 of 3)

	SCREENING EVALUATIO	N WORK SHEET (S	EWS)			
Equ	ipment ID No.:	Equipment Class: Ai	r Com	presso	rs	
Equi	pment description:					
Syst	em:	-				
Equi	pment Location: Bldg.	Floor El.	Re	oom, R	ow/Co	ol.
Man	ufacturer, model, etc.:					
Weig	ght:					
Drav	ving No.:	Performance Category	<u>/:</u>			
Fun	ctionality Requirement					
	Contact Lead Relay Reviewer to determine if item For components whose function or structural integer all other components, only anchorage evaluations.	grity is required, complete		ctions (of this	form.
Seis	smic Capacity vs. Demand (Chapter 5)					
1.	Seismic Capacity based on: Reference Spectrum GERS Existing documentation Elevation where equipment receives seismic inpression on: In-structure response spectrum Other in-structure response spectrum scale factor) Design basis earthquake (DBE) Other	(IRS) per DOE-STD-102 ectrum (determine approp) per DOE-STD-1020		xperie	nce da	ata
	Scale Factor (SF) Ex	perience Data Factor (F _E	_D)			
Does	s capacity exceed demand?		Υ	Ν	U	
Refe	rence:					
Cav	reats (Section 8.2.6)					
meet	erence Spectrum (Identify with an asterisk (*) the specific wording of the caveat rule and explain IMENTS section below)					t
1. 2.	Equipment is included in earthquake experience Have you looked for and found no other adverse		Y	N N	Ü	N/A N/A
Is the	e intent of all the caveats met for Reference Spectro	um?	Y	N	U	N/A

SEWS 8.2.6 (2 of 3)

Equipment ID No.: Equipment Class: Air Compressors								
quip	ment description	1:						
Incl	horage (Chapte	r a						
	Type of ancho			<u> </u>				
•		expansion anchor						
		cast-in-place bolt or headed stud anch	or					
	ā	cast-in-place J-bolt						
	ā	grouted-in-place bolt						
		welds to embedded steel on exposed	steel					
	ā	lead cinch anchors						
	<u> </u>	Other						
	ä	N/A (no further anchorage consideration	ons)					
2.	Appropriate c	haracteristics for anchorage type checked	1					
		ion, equipment characteristics)	Y	N	U			
3.		led anchor less than 1/4 inch	Ý	N	Ü	N/A		
4.	•	s and no significant prying action requiren		N	Ū			
5.		ase strength and structural load path adec		N	Ū			
6.		steel and pads requirements met	Ϋ́	N	U	N/A		
7.		ength requirements met	Υ	Ν	U			
8.		ng requirements met	Υ	Ν	U			
9.		e requirements met	Y	Ν	U			
0.		ngth requirements met	Υ	N	U			
1.		ck requirements met	Y	N	U			
2.		th essential relays requirements met	Y	N	U	N/A		
3.		dequacy requirements met	Y	N	U	N/A		
4.	No other con	cerns	Υ	N	U			
oes	anchorage capa	acity exceed demand?	Y	N	U			
efer	ence:							
nte	action Effec	fs (Chapter 7)						
· rei		ree from impact by nearby equipment						
	or structure		Υ	Ν	U	N/A		
		contains sensitive essential relays, equip	ment free					
		act by nearby equipment or structures	Y	Ν	U	N/A		
•		s have adequate flexibility	Υ	N	U	N/A		
•		of overhead equipment, distribution system						
	or masonry		Υ	N		N/A		
		free from credible and significant	17			A		
		uced flood and spray concerns	Y	N	U	N/A		
		eismic-induced fire concerns	Y STD-1021 Y	N N	U	N/A N/A		
•		o over one" concerns as defined in DOE-S	Y 1021 Y	N	U	N/A N/A		
	No other con-	GETTIS	Ť	IN	U	IN/A		

SEWS 8.2.6 (3 of 3)

	SC	REENING	EVALUATION W	ORK SHEET (SEWS)	(Cont.)
Equip	ment ID No.:			Equipment Class: Air C	
Equip	ment description	1:			
Com	ments				
Scree	ning Walkdown(s):			
	<u>Date</u>	<u>Time</u>	Team Members		
Reco	mmend Res	olution			
	Maintenance a	action:			
	Further evalua	tion:			
	Retrofit design	<u> </u>			
	Other:				
	No further action	on required.	Equipment is seismica	ally adequate.	
All asp	ects of the equip	oment's seis	mic adequacy have be	en addressed.	
Evalua	tion by:				Date:
(All tea	ım members)				
	-				
	-				

SEWS 8.2.7 (1 of 3) Sheet 1 of _____

SCREENING EVALUATION	N WORK SHEET (SEV	VS)						
Equipment ID No.:	Equipment Class: Moto	r-Gen	erato	rs				
Equipment description:								
System:		·	·					
Equipment Location: Bldg.	Floor El.	Roo	m, Ro	ow/Co	<u>. </u>			
Manufacturer, model, etc.:								
Weight:		<i>,</i>		· · · · · ·				
Drawing No.:	Performance Category:							
Functionality Requirement								
 Contact Lead Relay Reviewer to determine if item contains Essential Relays For components whose function or structural integrity is required, complete all sections of this form. For all other components, only anchorage evaluation is required. 								
Seismic Capacity vs. Demand (Chapter 5)								
Seismic Capacity based on: Reference Spectrum GERS Existing documentation Elevation where equipment receives seismic inpose Seismic Demand Spectrum (SDS) based on: In-structure response spectrum Other in-structure response spectrum scale factor) Design basis earthquake (DBE) Other	(IRS) per DOE-STD-1020 ectrum (determine appropria	ate ex	perier	nce da	ta			
Scale Factor (SF) Ex	perience Data Factor (F _{ED})							
Does capacity exceed demand?		Y	N	U				
Reference:								
Caveats (Section 8.2.7)								
Reference Spectrum (Identify with an asterisk (*) those caveats which are met by intent without meeting the specific wording of the caveat rule and explain the reason for this conclusion in the COMMENTS section below)								
 Equipment is included in earthquake experience Main driver and driven equipment connected by 		Y	N	U	N/A			
or skid 3. Have you looked for and found no other advers	e concerns?	Y Y	N N	U U	N/A N/A			
Is the intent of all the caveats met for Reference Spectrum? Y N U N/A								

SEWS 8.2.7 (2 of 3)

qui	oment ID No.: Equipment C	ass: Motor-Gen	erato	rs	
guip	ment description:				
	horage (Chapter 6)				
•	Type of anchorage: expansion anchor				
	•				
	— · · · · · · · · · · · · · · · · · · ·				
	ground in place bon				
	lead cinch anchors				
	Other				
	□ N/A (no further anchorage considerations)				
2.	Appropriate characteristics for anchorage type checked				
	(size, location, equipment characteristics)	Υ	N	U	
3.	Gap at threaded anchor less than 1/4 inch	Υ	N	U	N/
4.	Base stiffness and no significant prying action requirements me		N	U	
5.	Equipment base strength and structural load path adequate	Υ	N	U	
3.	Embedment steel and pads requirements met	Y	N	U	N
7.	Embedment length requirements met	Y	N	U	
8.	Anchor spacing requirements met	Y	N	U	
9.	Edge distance requirements met	Y	N	U	
0.	Concrete strength requirements met	Y	N	U	
1.	Concrete crack requirements met	Y	N N	U	N
2. 3.	Equipment with essential relays requirements met Installation adequacy requirements met	Y	N	U	N/
3. 4.	No other concerns	Ϋ́	N	Ü	137
oes	anchorage capacity exceed demand?	Υ	N	U	
	ence:				
ne	raction Effects (Chapter 7) Soft targets free from impact by nearby equipment				
•	or structures	Υ	N	U	N
	If equipment contains sensitive essential relays, equipment fre		• •	•	
,	from all impact by nearby equipment or structures	Υ	N	U	Ν
	Attached lines have adequate flexibility	Y	N	Ū	N
	No collapse of overhead equipment, distribution systems,				
	or masonry walls	Y	N		Ν
•	Equipment is free from credible and significant				
	seismic-induced flood and spray concerns	Y	N	U	N
	No credible seismic-induced fire concerns	Y	N		N
	No other "two over one" concerns as defined in DOE-STD-102		N		N
	No other concerns	Y	N	U	N

SEWS 8.2.7 (3 of 3)

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Sn	eet	:3	OΤ		

	SCI	REENING E	VALUATION W	ORK SHEET (SEWS)	(Cont.)
Equip	ment ID No.:			Equipment Class: Moto	
Equip	ment description	:			
Com	ments				
Scree	ning Walkdown(s	s):			
	<u>Date</u>	<u>Time</u>	Team Members		
		•			
Reco	ommend Res	olution			
	Maintenance a	action:			
	Further evalua	tion:			
	Retrofit design	i:			
۵	Other:		74************************************		
	No further action	on required. E	quipment is seismic	ally adequate.	
All asp	pects of the equip	oment's seismi	c adequacy have be	een addressed.	
Evalua	ation by:				Date:
(All tea	am members)			W	

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SEWS 8.2.8 (1 of 3)

Sheet	4	٥f	
Sheet	1	OΤ	

SCREENING EVALUATION	N WORK SHEET (SEV	NS)			
Equipment ID No.:	Equipment Class: Engi	ne-Gei	nerato	ors	
Equipment description:					
System:		T			
Equipment Location: Bldg.	Floor El.	Roor	m, Ro	w/Col.	
Manufacturer, model, etc.:					
Weight:					
Drawing No.:	Performance Category:				
Functionality Requirement					
Contact Lead Relay Reviewer to determine if item For components whose function or structural interpretation of the For all other components, only anchorage evaluations.	egrity is required, complete a	II section	ons of	this fo	orm.
Seismic Capacity vs. Demand (Chapter 5)					
 Seismic Capacity based on: Reference Spectrum GERS Existing documentation Elevation where equipment receives seismic in Seismic Demand Spectrum (SDS) based on: In-structure response spectrum Other in-structure response spectrum Design basis earthquake (DBI Other Othe	m (IRS) per DOE-STD-1020 pectrum (determine appropria E) per DOE-STD-1020	ate exp	periend	ce dat	a
Scale Factor (SF)	xperience Data Factor (F _{ED})				
Does capacity exceed demand?		Y	N	U	
Reference:					
Caveats (Section 8.2.8)					
Reference Spectrum (Identify with an asterisk (*) meeting the specific wording of the caveat rule and ex COMMENTS section below)					
 Equipment is included in earthquake experient Driver and driven equipment connected by a remark 		Υ	N	U	N/A
common skid 3. Have you looked for and found no other adver	se concerns?	Y	N N	U	N/A N/A
Is the intent of all the caveats met for Reference Spec	trum?	Y	N	U	N/A

SEWS 8.2.8 (2 of 3)

qui	oment ID No.:	Equipment Class:	s: Engine-Generators					
quip	ment description:							
4nc	horage (Chapter 6)							
	Type of anchorage:	<u></u>						
	expansion anchor							
	cast-in-place bolt or hear	ded stud anchor						
	cast-in-place J-bolt							
	grouted-in-place bolt							
	welds to embedded stee	l on exposed steel						
	lead cinch anchors							
	Other							
	N/A (no further anchorage	ge considerations)						
2.	Appropriate characteristics for anchorage	e type checked						
	(size, location, equipment characteristic		Υ	N	U			
3.	Gap at threaded anchor less than 1/4 inc		Ý	N	Ū	N/A		
4.	Base stiffness and no significant prying a		Ý	N	Ū			
5.	Equipment base strength and structural I	•	Y	N	Ū			
6.	Embedment steel and pads requirements		Υ	Ν	U	N/A		
7.	Embedment length requirements met		Υ	Ν	U			
В.	Anchor spacing requirements met		Υ	N	U			
9.	Edge distance requirements met		Υ	Ν	U			
0.	Concrete strength requirements met		Υ	N	U			
1.	Concrete crack requirements met		Y	N	U			
2.	Equipment with essential relays requiren	nents met	Y	N	U	N/A		
3.	Installation adequacy requirements met		Y	N	U	N/A		
4.	No other concerns		Υ	N	U			
oes	anchorage capacity exceed demand?		Υ	Ν	U			
lefe	rence:							
nte	raction Effects (Chapter 7)							
	Soft targets free from impact by nearby	equipment						
	or structures	,	Y	N	U	N/A		
· ·	If equipment contains sensitive essential							
	from all impact by nearby equipment o	r structures	Y	N	U	N/A		
•	Attached lines have adequate flexibility	uib	Y	N	U	N/A		
•	No collapse of overhead equipment, dist	ribution systems,	V	K I		RI/A		
	or masonry walls	ificant	Υ	N		N/A		
.	Equipment is free from credible and sign		Υ	N	U	N/A		
	seismic-induced flood and spray conce No credible seismic-induced fire concerr		Ϋ́	N	J	N/A		
i.	No other "two over one" concerns as def		Ÿ	N		N/A		
	No other concerns	1100 III DOL 01D-1021	Ý	Ň	U	N/A		
1	140 OTHER COHOEITIS		•	. •	_	. 411		

SEWS 8.2.8 (3 of 3)

	SCF	REENING E	VALUATION W	ORK SHEET (SEWS)	(Cont.)
Equip	ment ID No.:			Equipment Class: Eng	
Equipn	nent description:				
Comi	ments				
Screen	ing Walkdown(s) :			
	<u>Date</u>	<u>Time</u>	Team Members	<u> </u>	
Reco	mmend Reso	lution			
	Maintenance ad	ction:			
	Further evaluat	ion:			
	Retrofit design:				
	Other:				
	No further actio	n required. E	quipment is seismi	cally adequate.	
All aspe	ects of the equip	ment's seismi	c adequacy have b	een addressed.	
Evalua	tion by:				Date:
(All tea	m members) _				
	_		· · · · · · · · · · · · · · · · · · ·		
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SEWS 8.2.9 (1 of 3)

SCREENING EVALU	ATION WORK SHEET	(SEWS)			
Equipment ID No.:	Equipment Class:	Air Hand	lers		-
Equipment description:					
System:					
Equipment Location: Bldg.	Floor El.	Ro	om, R	ow/Co	ol.
Manufacturer, model, etc.:		<u> </u>			
Weight:					
Drawing No.:	Performance Categ	ory:			
Functionality Requirement					
Contact Lead Relay Reviewer to determine For components whose function or structure For all other components, only anchorage of	al integrity is required, comp	•	ctions	of this	form.
Seismic Capacity vs. Demand (Chapter 5)				
Other in-structure responscale factor) Design basis earthquake Other	on: ectrum (IRS) per DOE-STD- nse spectrum (determine app e (DBE) per DOE-STD-1020	propriate e	experie	nce da	ata
Scale Factor (SF)	Experience Data Factor				
Does capacity exceed demand?		Y	N	U	
Caveats (Section 8.2.9) Reference Spectrum (Identify with an asteris meeting the specific wording of the caveat rule ar COMMENTS section below)					t
1. Equipment is included in earthquake expe	rience equipment class	Υ	N	U	N/A
 Anchorage of heavy internal components vibration isolators have seismic stops to lateral movement All doors secured by latch or fastener 	is adequate; internal limit uplift and	Y Y	N N	U U	N/A N/A
4. No possibility of excessive duct distortion	causing binding or	Y	N	U	N/A
misalignment of any internal fan 5. Have you looked for and found no other a	dverse concerns?	Ϋ́Υ	N	ΰ	N/A N/A
Is the intent of all the caveats met for Reference	Spectrum?	Y	N	U	N/A

SEWS 8.2.9 (2 of 3)

.qui	pment ID No.:	Equip	ment Class: Air Hand	lers		
quir	ment description	n:				
	horage (Chapt					
	Type of anch					
	Ü	expansion anchor	_			
	<u> </u>	cast-in-place bolt or headed stud ancho	r			
	Ä	cast-in-place J-bolt				
		grouted-in-place bolt				
		welds to embedded steel on exposed st	eel			
		lead cinch anchors				
		Other				
		N/A (no further anchorage consideration	ıs)			
2.	Appropriate o	haracteristics for anchorage type checked				
		on, equipment characteristics)	Υ	N	U	
3.		ded anchor less than 1/4 inch	Υ	Ν	U	N/A
4.		s and no significant prying action requireme		Ν	U	
5.		ase strength and structural load path adequ		N	U	
6.		steel and pads requirements met	Υ	N	U	N/A
7.		ength requirements met	Y	N	U	
8.		ng requirements met	Y	N	U	
9.		e requirements met	Y	N	U	
0.		ength requirements met	Y	N	U	
1.		ck requirements met	Y	N	U	B1/4
2.		ith essential relays requirements met	Y	N	U	N/A
3.		dequacy requirements met	Y	N	U	N/A
4.	No other con	cerns	Y	N	U	
)oes	anchorage capa	acity exceed demand?	Y	N	U	
lefe:	rence:					
ماروا	raction Effec	te Charlet				
ine I.		ree from impact by nearby equipment				
•	or structure		Υ	Ν	U	N/A
2.		contains sensitive essential relays, equipm		-		
-		pact by nearby equipment or structures	Υ	N	U	N/A
3.		s have adequate flexibility	Υ	N	U	N/A
١.		of overhead equipment, distribution system				
	or masonry	walls	Y	Ν		N/A
5.	Equipment is	free from credible and significant				
		luced flood and spray concerns	Υ	N	U	N/A
3 .		eismic-induced fire concerns	Y	N		N/A
7.	No other "two	o over one" concerns as defined in DOE-S1		N		N/A
•	NI	corne	Υ	N	U	N/A
7 . 3.	No other con	Cerris	•	•	_	

SEWS 8.2.9 (3 of 3)

Sheet	Q	of	
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	SCF	REENING E	VALUATION W	ORK SHEET (SEWS) (Cont.)
Equip	ment ID No.:			Equipment Class: Air Handlers
Equipr	ment description:			
Com	ments			
Screen	ning Walkdown(s	s) :		
	<u>Date</u>	<u>Time</u>	Team Members	
Reco	mmend Reso	olution		
	Maintenance a	ction:		
	Further evaluat	tion:		
	Retrofit design:			
	Other:	···		
	No further action	on required. E	quipment is seismic	ally adequate.
All asp			c adequacy have be	
Evalua	tion by:			Date:
(All tea	ım members)			
	-			
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SEWS 8.2.10 (1 of 3) Sheet 1 of _____

quipment ID No.: Equi	ipment Class:	Class: Fans						
quipment description:								
	r El.	Ro	om, R	ow/Co	ol.			
/eight:	· · · · · · · · · · · · · · · · · · ·	1	.,					
· · · · · · · · · · · · · · · · · · ·	ormance Categ	ory:						
unctionality Requirement								
Contact Lead Relay Reviewer to determine if item contains For components whose function or structural integrity is a For all other components, only anchorage evaluation is recommonly.	required, compl	•	ctions	of this	form.			
eismic Capacity vs. Demand (Chapter 5)								
Seismic Capacity based on: Reference Spectrum								
GERS Existing documentation Elevation where equipment receives seismic input Seismic Demand Spectrum (SDS) based on: In-structure response spectrum (IRS) Other in-structure response spectrum scale factor) Design basis earthquake (DBE) per Di	per DOE-STD- (determine app OE-STD-1020		xperie	nce da	ata			
Existing documentation Elevation where equipment receives seismic input Seismic Demand Spectrum (SDS) based on: In-structure response spectrum (IRS) Other in-structure response spectrum scale factor) Design basis earthquake (DBE) per Design basis	per DOE-STD- (determine app OE-STD-1020	ropriate e	xperie	nce da	ata			
Existing documentation Elevation where equipment receives seismic input Seismic Demand Spectrum (SDS) based on: In-structure response spectrum (IRS) Other in-structure response spectrum scale factor) Design basis earthquake (DBE) per Design basis earthquake (DBE)	per DOE-STD- (determine app OE-STD-1020	ropriate e	xperie	nce da	ata			
Existing documentation Elevation where equipment receives seismic input Seismic Demand Spectrum (SDS) based on: In-structure response spectrum (IRS) Other in-structure response spectrum scale factor) Design basis earthquake (DBE) per Delevation of the Scale Factor (SF) Experience	per DOE-STD- (determine app OE-STD-1020	ropriate e			ata			
Existing documentation Elevation where equipment receives seismic input Seismic Demand Spectrum (SDS) based on: In-structure response spectrum (IRS) Other in-structure response spectrum scale factor) Design basis earthquake (DBE) per Design basis earthquake (DBE) pe	per DOE-STD- (determine app OE-STD-1020	ropriate e			ata			
Existing documentation Elevation where equipment receives seismic input Seismic Demand Spectrum (SDS) based on: In-structure response spectrum (IRS) Other in-structure response spectrum scale factor) Design basis earthquake (DBE) per Design basis earthquake (DBE) pe	per DOE-STD- (determine app OE-STD-1020 ce Data Factor	(F _{ED}) Y	N Intent v	U				
Existing documentation Elevation where equipment receives seismic input Seismic Demand Spectrum (SDS) based on: In-structure response spectrum (IRS) Other in-structure response spectrum scale factor) Design basis earthquake (DBE) per Design basis earthquake (DBE) pe	per DOE-STD- (determine app OE-STD-1020 ce Data Factor aveats which are reason for this	(F _{ED}) Y	N Intent von in the	U without	t N/A			
Existing documentation Elevation where equipment receives seismic input Seismic Demand Spectrum (SDS) based on: In-structure response spectrum (IRS) Other in-structure response spectrum scale factor) Design basis earthquake (DBE) per Design basis earthquake (DBE) p	per DOE-STD- (determine app OE-STD-1020 ce Data Factor aveats which are reason for this	e met by i	N Intent von in the	without ne	t N/A N/A			
Existing documentation Elevation where equipment receives seismic input Seismic Demand Spectrum (SDS) based on: In-structure response spectrum (IRS) Other in-structure response spectrum scale factor) Design basis earthquake (DBE) per Di Other Scale Factor (SF) Experience eference: aveats (Section 8.2.10) eference Spectrum (Identify with an asterisk (*) those categories the specific wording of the caveat rule and explain the DMMENTS section below) Equipment is included in earthquake experience equipment of the properties of the common base for axial fan with long shaft between fan and motor, sha supported at fan as well as motor	per DOE-STD- (determine app OE-STD-1020 ce Data Factor aveats which are reason for this ment class aft	(F _{ED}) Y	N Intent von in the	U without	t N/A			
Existing documentation Elevation where equipment receives seismic input Seismic Demand Spectrum (SDS) based on: In-structure response spectrum (IRS) Other in-structure response spectrum scale factor) Design basis earthquake (DBE) per Document of the company of the caveat rule and explain the OMMENTS section below) Equipment is included in earthquake experience equipment on the company of the company of the company of the company of the caveat rule and explain the OMMENTS section below) Equipment is included in earthquake experience equipment of the caveat rule and motor, shall between fan and motor, shall carried the caveat rule and motor, shall carried the specific wording of the caveat rule and explain the OMMENTS section below)	per DOE-STD- (determine app OE-STD-1020 ce Data Factor aveats which are reason for this ment class aft	e met by i	N Intent von in the	without ne	t N/A N/A			

SEWS 8.2.10 (2 of 3)

Equipment ID No.: Equipment Class: Fans						
Equip	ment description:					
\nc	horage (Chapter 6)					
- -	Type of anchorage:					
•	expansion anchor					
	ast-in-place bolt or headed stud a	nchor				
	cast-in-place J-bolt					
	grouted-in-place bolt					
	welds to embedded steel on expos	ed steel				
	lead cinch anchors					
	Other					
	N/A (no further anchorage conside	rations)				
2	Appropriate characteristics for anchorage type cho	okod				
2.	Appropriate characteristics for anchorage type che- (size, location, equipment characteristics)	UNGU	Υ	N	U	
3.	Gap at threaded anchor less than 1/4 inch		Ϋ́	N	Ü	N/A
ა. 4.	Base stiffness and no significant prying action requ	irements met	Ý	N	Ü	14/7
4 . 5.	Equipment base strength and structural load path a		Ý	N	Ü	
6.	Embedment steel and pads requirements met	.aoqua.o	Ÿ	N	Ū	N/A
7.	Embedment length requirements met		Ý	N	Ū	
8.	Anchor spacing requirements met		Υ	Ν	Ū	
9.	Edge distance requirements met		Υ	Ν	U	
0.	Concrete strength requirements met		Υ	Ν	U	
1.	Concrete crack requirements met		Υ	N	U	
2.	Equipment with essential relays requirements met		Υ	Ν	U	N/A
3.	Installation adequacy requirements met		Υ	N	U	N/A
4.	No other concerns		Υ	N	U	
oes	anchorage capacity exceed demand?		Υ	N	U	
lefer	ence:					
nte:	raction Effects (Chapter 7) Soft targets free from impact by nearby equipment					
•	or structures		Υ	N	U	N/A
2.	If equipment contains sensitive essential relays, ed	uipment free	•		_	/• •
•	from all impact by nearby equipment or structure		Υ	Ν	U	N/A
3.	Attached lines have adequate flexibility		Y	N	Ū	N/A
	No collapse of overhead equipment, distribution sy	rstems,				
	or masonry walls		Υ	Ν		N/A
5 .	Equipment is free from credible and significant					
	seismic-induced flood and spray concerns		Υ	N	U	N/A
5 .	No credible seismic-induced fire concerns		Υ	Ν		N/A
' .	No other "two over one" concerns as defined in DC	E-STD-1021	Y	N		N/A
3.	No other concerns		Y	N	U	N/A
) .						

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Sheet 3 of

	SCF	REENING EV	VALUATION WO	ORK SHEET (SEWS)	(Cont.)
Equip	ment ID No.:			Equipment Class: Fans	
Equipn	nent description:		-		
Comi	nents				
Screen	ing Walkdown(s):			
	<u>Date</u>	<u>Time</u>	Team Members		
Reco	mmend Reso	olution			
	Maintenance a	ction:			
	Further evaluat	tion:			
	Retrofit design:	: <u> </u>			
	Other:				
	No further action	on required. Ed	quipment is seismic	ally adequate.	
All asp	ects of the equip	ment's seismic	adequacy have be	een addressed.	
Evalua	tion by:				
(All tea	m members)				·
	-				 -
	-				

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SEWS 9.1.2 (1 of 4)

Sheet 1 of _____

	SCREENING EVALUATION	N WORK SHEET (SE	WS)			
Equipme	ent ID No.:	Equipment Class: Horiz Heat		l Tank anger		
Equipme	nt description:					
Equipme	nt Location: Bldg.	Floor El.	Roc	om, Ro	w/Col	•
Manufact	urer, model, etc.:					
Approxim	nate weight:					
Drawing	No.:	Performance Category:				
Functio	onality Requirement					
☐ For	ntact Lead Relay Reviewer to determine if item components whose function or structural integrall other components, only anchorage evaluati	rity is required, complete a	ll sect	ions o	f this f	orm.
Caveat	S (Section 9.1.2)					
	with an asterisk (*) those steps which are met b explain the reason for this conclusion in the CC		e sped	cific wo	ording	of the
Step 1	Parameters and values within range of applica	ble parameters	Y	N	U	N/A
Step 2	Anchor bolt tension and shear load allowables	determined	Y	N	U	N/A
Step 3	Base plate bending strength reduction factor (RB) determined	Y	N	U	N/A
Step 4	Base plate weld strength reduction factor (RW	determined	Y	N	U	N/A
Step 5	Anchorage tension allowable determined using reduction factors	g strength	Y	N	U	N/A
Step 6	Ratios and values calculated		Y	N	U	N/A
Step 7	Acceleration capacity of tank anchorage deter	mined	Y	N	U	N/A
Step 8	Flexibility of tank in transverse and vertical dire	ections determined	Y	N	U	N/A
Step 9	Flexibility of tank in longitudinal direction deter	mined	Y	N	U	N/A
Step 10	Capacity acceleration exceeds seismic deman	nd acceleration	Υ	N	U	N/A
Step 11	Saddle stresses checked		Y	N	U	N/A

SEWS 9.1.2 (2 of 4)

Sheet 2 of _____

					: Horizontal Tanks and Heat Exchangers				
Equip	ment descriptio	ղ։							
Anc	horage (Chapt	er 6)							
1.	Type of anch								
		expansion anchor							
		cast-in-place bolt or headed stud and	hor						
		cast-in-place J-bolt							
		grouted-in-place bolt							
		welds to embedded steel on exposed	steel						
		lead cinch anchors							
		Other							
		N/A (no further anchorage considera	ions)						
2.		haracteristics for anchorage type check	ed						
		on, equipment characteristics)		Υ	N	U			
3.		ded anchor less than 1/4 inch		Y	N	U	N/A		
4 .		s and no significant prying action require		Y	N	U			
5.		ase strength and structural load path add	equate	Y Y	N	U	NI/A		
6. 7		steel and pads requirements met		Y	N N	U	N/A		
7. 8.		length requirements met ng requirements met		Ý	N	Ü			
o. 9.		e requirements met		Ÿ	N	Ü			
9. 10.		ength requirements met		Ý	N	Ŭ			
11.		ck requirements met		Ý	N	Ū			
12.		ith essential relays requirements met		Υ	N	U	N/A		
13.		dequacy requirements met		Υ	Ν	U	N/A		
14.	No other con			Y	N	U			
Does	anchorage cap	acity exceed demand?		Y	N	U			
Refe	rence:								
Inte	raction Effec	ts (Chapter 7)							
1.		ree from impact by nearby equipment		Y	N	U	N/A		
^	or structure		amont frog	Ť	IN	U	IN/A		
2.		contains sensitive essential relays, equi pact by nearby equipment or structures	Juigiil 1166	Υ	N	U	N/A		
3.		s have adequate flexibility		Ý	N	Ü	N/A		
3. 4.		of overhead equipment, distribution syst	ems.	•	• •	_			
7.	or masonn		- 7	Υ	N		N/A		
5.		free from credible and significant							
		luced flood and spray concerns		Υ	Ν		N/A		

SEWS 9.1.2 (3 of 4)

Sheet 3 of _____

quipment ID No.:	Equipment Class	: Horizont Heat Exc	al Tan hange	ks and ers	t
Equipment description:					
teraction Effects (Cont.)					
No credible seismic-induced fire concer No other "two over one" concerns as de No other concerns		Y Y Y	N N N	U	N/A N/A N/A
equipment free of interaction effects?		. Y	N	U	
omments					

SEWS 9.1.2 (4 of 4)

Sheet 4 of _____

quip	ment ID No.:			Equipment Class:	Heat Exchangers
quip	ment description	1:			
Com	ments (Cont.)				
Scree	ning Walkdown(s):			
	<u>Date</u>	<u>Time</u>	Team Membe	<u>rs</u>	
Rec	ommend Res	solution			
	ommend Res Maintenance				
)		action:			
<i>Rec</i>	Maintenance	action:			
]]	Maintenance Further evalu	action:			
	Maintenance Further evalue Retrofit desig Other:	action: ation: n:	Equipment is seisi		
	Maintenance Further evalue Retrofit desig Other: No further act	action: ation: n: tion required.		nically adequate.	
	Maintenance Further evalue Retrofit desig Other: No further act	action: ation: n: tion required.	Equipment is seisi	nically adequate.	. Date:
O O O O O O O O O O O O O O O O O O O	Maintenance Further evalue Retrofit desig Other: No further accepted of the equality	action: ation: n: tion required.	Equipment is seisi	nically adequate. been addressed.	

SEWS 9.2.1 (1 of 6)

Sheet 1 of _____

Equipment ID No.:	Equipment Class:	Cable and Conduit Raceway
Cable tray/Conduit identification:		Systems
Systems:	F1 F1 (0)	
Building:	Floor El. (S):	Location:
Performance Category:		
Tray System or Conduit Bounds	ary	
Cable tray/Conduit description:		
Description or sketch (attach sheets as n	ecessary):	
Functionality Requirement		
Functionality Requirement Maintain electrical cable function		

SEWS 9.2.1 (2 of 6)

Shee	t 2	of	
SHEE	ız	UI	

	SC	REENING EVALUA	ATION WORK SHEET (SI	EWS) (Co	nt.)				
Equipment ID No.: Equipme			Equipment Class	nent Class: Cable and Conduit Raceway Systems					
Cable	e tray/Conduit ide	entification:							
Syste	ems:								
Seis	smic Capacity	/ vs. Demand (Chap	oter 5)						
1. 2.	☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐		tion seismic input						
	Seismic Dema	Other in-structure re scale factor) Design basis earthq	ased on: e spectrum (IRS) per DOE-ST[esponse spectrum (determine a uake (DBE) per DOE-STD-102	ppropriate e 0	xperie	nce da	ata		
	Scale	Factor (SF)	Experience Data Facto	or (F _{ED}) _					
Does	capacity exceed	demand?		Υ	N	U			
Refe	rence:								
Incl	usion Rules I	Review (Section 9.2.1))						
1. C	able tray spans			Υ.	N	U	N/A		
2. C	onduit spans			Y	N	U	N/A		
3. Ti	ie downs			Y	N	U	N/A		
4. C	hannel nuts			Y	N	U	N/A		
5. R	igid boots			Y	N	U	N/A		
6. B	eam clamps			Y	N	U	N/A		
7. C	ast-iron inserts			Y	N	U	N/A		

SEWS 9.2.1 (3 of 6)

Sheet 3 of _____

Equi	pment ID No.:	uipment Class: Cable an Systems	t Class: Cable and Conduit Raceway Systems				
Cable tray/Conduit identification:							
Syste	ems:						
Ger	neral Walkdown Review (Section 9.2.1)						
1.	Anchor bolts	Υ	N	U	N/A		
2.	Concrete condition	Y	N	U	N/A		
3.	Corrosion	Y	N	U	N/A		
4.	Sagging raceways	Y	N	U	N/A		
5.	Broken or missing components	Υ	N	U	N/A		
6.	Restraint of cables	Y	N	U	N/A		
7.	Aging of plastic ties	Y	N	U	N/A		
8.	System hardspots	Y	N	U	N/A		
	Welded connections	Y	N	U	N/A		
	Components and sharp edges	Y	N	U	N/A		
	Bare cables	Y	N	U	N/A		
	Cable fill/ties	Y	N	U	N/A		
	Short rods	Y	N	U	N/A		
Inte	raction Effects (Chapter 7)						
1.	Soft targets free from impact by nearby equipment or structures	Υ	N	U	N/A		
2.	If equipment contains sensitive essential relays, equ	pment free					
3.	from all impact by nearby equipment or structures Attached lines have adequate flexibility	Y	N N	U	N/A N/A		
3 .	No collapse of overhead equipment, distribution syst		14	J	IV/A		
_	or masonry walls	Υ	N		N/A		
5.	Equipment is free from credible and significant seismic-induced flood and spray concerns	Υ	N		N/A		
6.	No credible seismic-induced fire concerns	Ϋ́	N		N/A		
7.	No other "two over one" concerns as defined in DOE		N		N/A		
8.	No other concerns	Y	N	U	N/A		
_	uipment free of interaction effects?	Υ	N	U			

SEWS 9.2.1 (4 of 6)

Sheet 4 of _____

quipment ID No.:	Equipmen	t Class: Cable and Conduit Raceway Systems
able tray/Conduit identification:		
ystems:		
Analytical Review Support S	election	

SEWS 9.2.1 (5 of 6)

Sheet 5 of _____

Equipment ID No.:	Equipment Class: Cable and Conduit Ra Systems	ceway
Cable tray/Conduit identification:		
Systems:		
Analytical Review Data Shee	at .	
Room No.:	Selection No.:	
Location:		
Description and Sketch:		
Additional Notes:		

SEWS 9.2.1 (6 of 6)

Sheet 6 of _____

-1	oment ID No.:			Equipment Class: Cable Syste		У
Cable	tray/Conduit ide	ntification:				
Syste	ems:					
Соп	nments					
Scree	ening Walkdown(s):				
	<u>Date</u>	<u>Time</u>	Team Members			
	ommend Res					
Rec	commend Res Maintenance					
		action:				
	Maintenance	action:				
	Maintenance Further evalue	action:				
0	Maintenance Further evaluate Retrofit design Other:	action: ation: n:	Equipment is seismic	cally adequate.		——————————————————————————————————————
	Maintenance Further evaluate Retrofit design Other: No further act	action: ation: n: tion required.				
	Maintenance Further evaluate Retrofit desig Other: No further act	action: ation: n: tion required.	mic adequacy have b		Date:	
O All a	Maintenance Further evaluate Retrofit design Other: No further act	action: ation: n: tion required. ipment's seis	mic adequacy have b	een addressed.	Date:	——————————————————————————————————————
O All a	Maintenance Further evaluation by: Maintenance Further evaluation by:	action: ation: n: tion required. ipment's seis	mic adequacy have b	een addressed.	Date:	——————————————————————————————————————

SEWS 10.1.1 (1 of 3)

Sheet 1 of _____

SCREENING EVA	LUATION WORK SHEE	T (SEWS)
Piping System ID No.:	Equipment Cla	ss: Piping
Performance Category:		
System Description and Fluid Bou	ndaries:	
Piping System Function and Conte	ents	
Operability	Pressure Boudary	Position Retention
Piping Layout and Structural Boun Piping System Location and Refer		
Piping Materials and Sizes		
Weights		
Concurrent Pressure and Tempera	ture	
Input Response Spectra and SAM-Ref	erence	
Final	P	Preliminary
Applicability Ductile material D/t<5	50	°F Reference Spectra

SEWS 10.1.1 (2 of 3)

Sheet 2 of _____

Equipment Ci	ass: Piping
Screening Criterion Met	Notes
	Criterion

SEWS 10.1.1 (3 of 3)

Sheet 3 of _____

	sc	REENING I	EVALUATION W	ORK SHEET (SEWS)	(Cont.)		
Pipin	g System ID No			Equipment Class: Piping			
Con	ments						
Scree	ning Walkdown	(s):					
	<u>Date</u>	Time	Team Member	<u>rs</u>			
Reco	ommend Res	olution					
	Maintenance	action:					
۵	Further evalua	ation:					
۵	Retrofit design	n:	1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -				
a	Other:						
	No further act	ion required.	Equipment is seism	cally adequate.		-	
All asp	ects of the equi	pment's seism	nic adequacy have b	een addressed.			
	ation by:				_ Date:		
(All tea	am members)						
					.		

		,	

SEWS 10.4.1 (1 of 4)

Sheet 1 of _____

SCREENING EVALU	JATION WORK S	HEET (SEWS)		
Equipment ID No.:	t Class: HVAC	ucts			
HVAC line identification:					
System:	<u> </u>				
Building:	Floor El. (s):	Locatio	<u>n:</u>	·	
Operating Pressure:	PSIG	Inches	of water	•	
Performance Category:					
Duct System Boundary					
Functionality Requirement					
During seismic event After seismic event		Y	N N	U	
Structural Integrity Review (Section 10.4	1:1)				
 Duct free of damage, defects, and degrae Industry standard duct material and stiffe Industry standard duct joints are utilized Support spans satisfy the criteria Ducts are properly tied-down to the supp Heavy in-line equipment is adequately re Appurtenances are positively attached to No stiff branch with flexible header No other concerns Are the above caveats met? 	eners are utilized orts strained	Y Y Y Y Y Y Y	N N N		N/A N/A N/A N/A N/A N/A N/A

SEWS 10.4.1 (2 of 4)

Sheet 2 of _____

Equ	ipment ID No.: Equ	uipment Class: HVAC	Ducts		
HVA	C line identification:				
Syst	em:				
Pre	ssure Boundary Integrity Review (Section 10.4.1	<u>)</u>			
- -	Is any pressure boundary integrity required? If the answer to the above question is NO, SKIP THIS S	Y	N	U	_
1. 2. 3. 4.	Duct joints are rugged Stiffener spacings are within the guidelines Bolted flanged joints satisfy SMACNA (Tables G and H) No point supported round duct	Y	N N N	U U U	N/A N/A N/A N/A
5. 6.	Flexible bellows can accomodate motions No additional concerns	Y	N N	Ü	N/A N/A
	Are the above caveats met?	Y	N	U	
Sup	pport Review (Section 10.4.1)				
1. 2. 3. 4.	Beam Clamps are oriented to preclude slipping off the senuts have teeth or ridges, and no cast-iron inserts Support member capacity exceeds demand Does the anchorage appear adequate? No broken or obviously defective hardware No additional concerns	support, channel Y Y Y Y Y	N N N	U U U	N/A N/A N/A N/A
5.	Are the above caveats met?	Y		U	IN/A
Inte	eraction Effects (Chapter 7)				
1.	Soft targets free from impact by nearby equipment				B1/4
2.	or structures If equipment contains sensitive essential relays, equipment all impact by nearby equipment or structures	Y pment free Y	•	U	N/A N/A
3. 4.	Attached lines have adequate flexibility No collapse of overhead equipment, distribution systems or masonry walls	Υ	N	Ŭ	N/A N/A
5.	Equipment is free from credible and significant seismic-induced flood and spray concerns	Y	'N		N/A
6. 7. 8.	No credible seismic-induced fire concerns No other "two over one" concerns as defined in DOE- No other concerns	-STD-1021 Y Y	N	U	N/A N/A N/A
٠.	140 Other Collecting		. •	_	. 4/

SEWS 10.4.1 (3 of 4)

Sheet 3 of _____

SCREENING EVALUATION W	ORK SHEET (SEWS) (Cont.)
Equipment ID No.:	Equipment Class: HVAC Ducts
HVAC line identification:	
System:	
Bounding Candidate Evaluation	
Duct is not a candidate for bounding calculations	Y N U N/A
Discussion:	
Analytical Review	

SEWS 10.4.1 (4 of 4)

Sheet 4 of _____

	oment ID No.:			Equipment Class: HVAC	Ducts
HVA	C line identification:				
Syste	m;				
Con	nments				
Scree	ening Walkdown(s):				
	<u>Date</u> <u>T</u>	ime	Team Membe	<u>ers</u>	
	÷		•		
Red	ommend Resolu	ution			
Red	ommend Resol				
		ion:			
	Maintenance act	ion:			
	Maintenance act	ion:			
	Maintenance acti Further evaluation Retrofit design: Other:	ion: on:	Equipment is seis	mically adequate.	
0000	Maintenance acti Further evaluation Retrofit design: Other:	ion:			
O All a Eval	Maintenance act Further evaluation Retrofit design: Other: No further action spects of the equipmonation by:	ion:	nic adequacy have	e been addressed.	Date:
O All a Eval	Maintenance act Further evaluation Retrofit design: Other: No further action spects of the equipmentation by:	ion:	nic adequacy have	e been addressed.	Date:
O All a Eval	Maintenance act Further evaluation Retrofit design: Other: No further action spects of the equipmonation by:	ion:	nic adequacy have	e been addressed.	Date:

SEWS 10.X.X (1 of 2)

Sheet 1 of _____

SCREENING	EVALUATION W	ORK SHEET	(SEWS)		
ID No.:	Equ	ipment Class	•		
Building:			<u></u>		
Performance Category:	Floor El. (s):		Location:		
Description or Sketch					
					İ
					İ
					i
·					
,					
Functionality Requirement					
During seismic event After seismic event			Y	N U	
2. After seismic event			Y	N U	

SEWS 10.X.X (2 of 2)

Sheet 2 of _____

	SCI	REENING E	EVALUATION W	ORK SHE	ET (SEWS) (Cont.)	
ID No.:				Equipmer	nt Class:		
Buildin	ng:		Floor El	(s):	Location	on:	
Com	ments						
Screen	ning Walkdown(s	s):					
	<u>Date</u>	Time	Team Members				
Reco	mmend Res	olution					
	Maintenance a	action:					
ū	Further evalua	ition:					
	Retrofit design	ı:					
	Other:						
}							
	No further acti	on required.	Equipment is seismic	cally adequa	ate.		
All asp	pects of the equi	pment's seisn	nic adequacy have b	een addres	sed.		
ı	ation by:					Date:	
(All tea	am members)					,	

OSES (1 of 3)

OUTLIER SEISMIC EVALUATION SHEET (OSES)

1.	. OUTLIER IDENTIFICATION, DESCRIPTION, AND LOCATION					
	SEWS Form					
	Equipment ID Number	Equipment Class				
	Equipment Location: Building	Floor Elevation				
	Room or Row/Column	Base Elevation				
	Equipment Description					
	Performance Category					
2.	OUTLIER ISSUE DEFINITION					
۷.		and the second s				
	a. Identify all the screening guidelines which a guidelines could not be satisfied.)	are not met. (Check more than one if several				
	Mechanical and Electrical Equipment	Tanks and Heat Exchangers				
	Seismic Capacity vs. Demand	Caveats				
	Reference Spectrum Caveats	Anchorage				
	GERS Caveats	Interaction Effects				
	Anchorage	Other				
	Interaction Effects					
	Other					
	Facestial Delevie	Cable and Canduit Baseyey Systems				
	Essential Relays	Cable and Conduit Raceway Systems				
	Seismic Capacity vs. Demand	Seismic Capacity vs. Demand				
	Interaction Effects	Inclusion Rules Review				
	Mounting, Type, Location	General Walkdown Review				
	Other	Interaction Effects				
		Analytical Review				
		Other				

OSES (2 of 3)

Sheet 2 of _____

		OUTLIER SEISMIC EVALUA	TION SHEET (OSES) (Cont.)	
		Piping	HVAC Ducts	
		Screening Criterion	Structural Integrity Review	
		Other	Pressure Boundary Integrity Review	
			Support Review	
			Interaction Effects	
			Analytical Review	
			Other	·
	b.	Describe all the reasons for the outlier (i.e., signatories would consider this item of equip	oment to be evaluated for seismic adec	quacy):
3.	PR a.	OPOSED METHOD OF OUTLIER RESOLU Define proposed method(s) of resolving out		

OSES (3 of 3) Sheet 3 of ____

	OUTLIER SEISMIC EVALUATION SHEET (OSES) (Cont.)
).	Provide information needed to implement proposed method(s) for resolving outlier:
) <u>.</u>	Provide information on potential hardware upgrades:

a communicación de la companya de la			
The control of the co			
4 management			

SEDS (1 of 2) Sheet 1 of ____

SCREENING EVALUATION DATA SHEET (SEDS)									
Equip. Class (1)	Equip. ID No. (2)	System/Equipment Description (3)	Bldg. (4)	Floor Elev. (5)	Room or Row/Col (6)	Base Elev. (7)	Capacity Spectrum (8)		
			ļ <u>-</u>						
						<u> </u>			
				<u> </u>					
						-			
	<u></u>								
			 						
			 						

SIGNATURES:

All the information contained on this Screening Evaluation Data Sheet (SEDS) is, to the best of our knowledge and belief, correct and accurate. "All information" includes each entry and conclusion (whether evaluated to be seismically adequate or not).

proved: All Seismic Capability E	All Seismic Capability Engineers on the Seismic Review Team should s				
Print or Type Name	Signature	Date			
Print or Type Name	Signature	Date			
Print or Type Name	Signature	Date			

SEDS (2 of 2) Sheet 2 of _____

	SCR	EENING EVA	LUATION	DATA SHE	ET (SEDS) (Cont.)			
F _{ED} (9)	Demand Spectrum (10)	Cap > Demand? (11)	Caveats OK? (12)	Anchorage OK? (13)	Interact. OK? (14)	Equipment OK? (15)	Notes (16)		
							·		

					· · · · · · · · · · · · · · · · · · ·				
<u> </u>	-								
			<u> </u>				i		
ADDITIO	ONAL SIGNA	TURES:							
The info	ormation provi	ded to the Seisr	nic Capability	Engineers reg	arding syste	ms and operation	ons of the		
equipm	ent contained	on this SEDS is	, to the best o	of our knowledg	ge and belief	, correct and ac	ccurate.		
Approved: Signature(s) of Systems or Operations Engineers are required if the Seismic Capability Engineers deem it necessary.									
P	Print or Type Name Signature Date								

Signature

Signature

Date

Date

Print or Type Name

Print or Type Name

14. REFERENCES

- 1. "Generic Implementation Procedure (GIP) for Seismic Verification of Nuclear Plant Equipment", Revision 2, Seismic Qualification Utility Group, prepared by Winston & Strawn, EQE Incorporated, MPR Associates, Inc., Stevenson & Associates, and URS Corporation / John A. Blume & Associates, Engineers, February 14, 1992. (Volume 2 of DOE Binders)
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- 3. "Procedure for the Seismic Evaluation of SRS Systems Using Experience Data", SEP-6, Rev. 1, Westinghouse Savannah River Company, Aiken, South Carolina, February 14, 1992.
- 4. "Generic Implementation Procedure (GIP) for Seismic Verification of Nuclear Plant Equipment", Revision 3, Seismic Qualification Utility Group, being reviewed by the U.S. Nuclear Regulatory Commission, Rockville, Maryland.
- 5. DOE Order 420.1, "Facility Safety", U.S. Department of Energy, Washington, D.C., October 1996.
- 6. DOE-STD-1020-94 (CH-1), "Natural Phenomena Hazards Design and Evaluation Criteria for Department of Energy Facilities", U.S. Department of Energy, Washington, D.C., January 1996.
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- 8. DOE Order 5480.28, "Natural Phenomena Hazards Mitigation", U.S. Department of Energy, Washington, D.C., January 15, 1993.
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- 10. DOE-STD-1027-92, "Hazard Categorization and Accident Analysis Techniques for Compliance with DOE Order 5480.23, Nuclear Safety Analysis Reports", U.S. Department of Energy, Washington, D.C., December 1992.
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- 12. IEEE-344-1975, "IEEE Recommended Practices for Seismic Qualification of Class 1E Equipment for Nuclear Power Generating Stations", Institute of Electrical and Electronics Engineers, 1975.
- 13. Unresolved Safety Issue (USI) A-46, "Seismic Qualification of Equipment in Operating Plants", U.S. Nuclear Regulatory Commission, Rockville, Maryland, December 1980.

- 14. 10CFR100, Appendix A, Code of Federal Regulations Energy, Office of the Federal Register National Archives and Records Administration, Washington, D.C., 1990.
- 15. NRC Generic Letter 87-02, "Verification of Seismic Adequacy of Mechanical and Electrical Equipment in Operating Reactors, Unresolved Safety Issue (USI) A-46", U.S. Nuclear Regulatory Commission, Rockville, Maryland, February 19, 1987.
- 16. NUREG-1030, "Seismic Qualification of Equipment in Operating Nuclear Power Plants, Unresolved Safety Issue A-46", U.S. Nuclear Regulatory Commission, Washington, D.C., February 1987.
- 17. NUREG-1211, "Regulatory Analysis for Resolution of Unresolved Safety Issue A-46, Seismic Qualification of Equipment in Operating Plants", U.S. Nuclear Regulatory Commission, Washington, D.C., February 1987.
- 18. EPRI Report NP-6041, Revision 1, "A Methodology for Assessment of Nuclear Power Plant Seismic Margin", Electric Power Research Institute, Palo Alto, California, prepared by NTS Engineering and RPK Consulting, July 1991. (Volume 7 of DOE Binders)
- 19. SSRAP Report, "Use of Seismic Experience Data to Show Ruggedness of Equipment in Nuclear Power Plants", Revision 4, SAND92-0140 Part I, UC-523, Sandia National Laboratories, Albuquerque, New Mexico, prepared by Senior Seismic Review and Advisory Panel, February 28, 1991. (Volume 4 of DOE Binders)
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